

Oregon

Vehicle Inspection Program

— Annual EPA Report — 2011 Test Year

Submitted in compliance with the Federal Code of Regulations Title 40 Chapter I
Part 51 Subpart S Section 51.366 Data Analysis and Reporting

This consolidated report includes the following required annual & biennial reports:

1. Test Data Report
2. Quality Assurance Report
3. Quality Control Report
4. Enforcement Report
5. Additional Reporting Requirements (biennial report)



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Table of Contents

Acknowledgments	7
Oregon Program Overview	7
Preface	7
Test Data Report	7
(1) The Number of vehicles tested by model year and vehicle type	7
(2) By model year and vehicle type, the number and percentage of vehicles	8
(I) Failing initially, per test type	8
(II) Failing the first retest per test type	8
(III) Passing the first retest per test type	8
(IV) Initially failed vehicles passing the second or subsequent retest per test type	8
(V) Initially failed vehicles receiving a waiver	8
(VI) Vehicles with no known final outcome (regardless of reason)	8
(VII)-(X) [Reserved]	8
(XI) Passing the on-board diagnostic check	8
(XII) Failing the on-board diagnostic check	8
(XIII) Failing the on-board diagnostic check and passing the tailpipe test (if applicable)	8
(XIV) Failing the on-board diagnostic check and failing the tailpipe test (if applicable)	8
(XV) Passing the on-board diagnostic check and failing the I/M gas cap evaporative system test (if applicable)	8
(XVI) Failing the on-board diagnostic check and passing the I/M gas cap evaporative system test (if applicable)	9
(XVII) Passing both the on-board diagnostic check and I/M gas cap evaporative system test (if applicable)	9
(XVIII) Failing both the on-board diagnostic check and I/M gas cap evaporative system test (if applicable)	9
(XIX) MIL is commanded on and no codes are stored	9
(XX) MIL is not commanded on and codes are stored	9
(XXI) MIL is commanded on and codes are stored	9
(XXII) MIL is not commanded on and codes are not stored	9
(XXIII) Readiness status indicates that the evaluation is not complete for any module supported by on-board diagnostic systems	9
(3) The initial test volume by model year and test station	9
(4) The initial test failure rate by model year and test station	9
(5) The average increase or decrease in tailpipe emission levels for HC, CO, and NOX (if applicable) after repairs by model year and vehicle type for vehicles receiving a mass emissions test	9
Quality Assurance Report	10
(1) The number of inspection stations and lanes	10
(I) Operating throughout the year	10
Table 1	10
(II) Operating for only part of the year	11
(2) The number of inspection stations and lanes operating throughout the year	11
(I) Receiving overt performance audits in the year	11
(II) Not receiving overt performance audits in the year	11
(III) Receiving covert performance audits in the year	11
(IV) Not receiving covert performance audits in the year	11
(V) That have been shut down as a result of overt performance audits	11
(3) The number of covert audits	11
(I) Conducted with the vehicle set to fail per test type	11
(II) Conducted with the vehicle set to fail any combination of two or more test types	11
(III) Resulting in a false pass per test type	11
(IV) Resulting in a false pass for any combination of two or more test types	11
(V-VIII) [Reserved]	11
(4) The number of inspectors and stations	11

(I)	That were suspended, fired, or otherwise prohibited from testing as a result of covert audits	11
(II)	That were suspended, fired, or otherwise prohibited from testing for other causes	12
(III)	That received fines	12
(5)	The number of inspectors licensed or certified to conduct testing	12
(6)	The number of hearings	12
(I)	Held to consider adverse actions against inspectors and stations	12
(II)	Resulting in adverse actions against inspectors and stations	12
(7)	The total amount collected in fines from inspectors and stations by type of violation	12
(8)	The total number of covert vehicles available for undercover audits over the year	12
(9)	The number of covert auditors available for undercover audits	12
Quality Control Report		12
(1)	The number of emission testing sites and lanes in use in the program	12
(2)	The number of equipment audits by station and lane	12
(3)	The number and percentage of stations that have failed equipment audits	12
(4)	Number and percentage of stations and lanes shut down as a result of equipment audits	12
Enforcement Report		13
(1)	All varieties of enforcement programs shall, at a minimum, submit to EPA by July of each year a report providing basic statistics on the enforcement program for January through December of the previous year, including	13
(I)	An estimate of the number of vehicles subject to the inspection program, including the results of an analysis of the registration data base	13
(II)	The percentage of motorist compliance based upon a comparison of the number of valid final tests with the number of subject vehicles	13
(III)	The total number of compliance documents issued to inspection stations	13
(IV)	The number of missing compliance documents	13
(V)	The number of time extensions and other exemptions granted to motorists	13
(VI)	The number of compliance surveys conducted, number of vehicles surveyed in each, and the compliance rates found	13
(2)	Registration denial based enforcement programs shall provide the following additional information	14
(I)	A report of the program's efforts and actions to prevent motorists from falsely registering vehicles out of the program area or falsely changing fuel type or weight class on the vehicle registration, and the results of special studies to investigate the frequency of such activity	14
(II)	The number of registration file audits, number of registrations reviewed, and compliance rates found in such audits	14
(3)	Computer-matching based enforcement programs shall provide the following additional information	14
(I)	The number and percentage of subject vehicles that were tested by the initial deadline, and by other milestones in the cycle	14
(II)	A report on the program's efforts to detect and enforce against motorists falsely changing vehicle classifications to circumvent program requirements, and the frequency of this type of activity	14
(III)	The number of enforcement system audits, and the error rate found during those audits	14
(4)	Sticker-based enforcement systems shall provide the following additional information	14
(I)	A report on the program's efforts to prevent, detect, and enforce against sticker theft and counterfeiting, and the frequency of this type of activity	14
(II)	A report on the program's efforts to detect and enforce against motorists falsely changing vehicle classifications to circumvent program requirements, and the frequency of this type of activity	14
(III)	The number of parking lot sticker audits conducted, the number of vehicles surveyed in each, and the noncompliance rate found during those audits	14
Additional Reporting Requirements		15
(1)	Any changes made in program design, funding, personnel levels, procedures, regulations, and legal authority, with detailed discussion and evaluation of the impact on the program of all such changes	15

(2) Any weaknesses or problems identified in the program within the two-year reporting period, what steps have already been taken to correct those problems, the results of those steps, and any future efforts planned	15
<i>Acronyms Used in This Report</i>	16
<i>Exhibits and Charts</i>	17
Exhibit 1	17
Exhibit 2	18
Exhibit 3	19
Exhibit 4	20
Exhibit 5	21
Exhibit 6	22
Exhibit 7	23
Exhibit 8	24
Exhibit 9	25
Exhibit 10	26
Exhibit 11	27
Exhibit 12	28
Exhibit 13	28
Exhibit 14	29
Exhibit 15	29
Exhibit 16	30
Exhibit 17	30
Exhibit 18	31
Exhibit 19	31
Exhibit 20	32
Exhibit 21	32
Exhibit 22	33
Exhibit 23	33
Exhibit 24	34
Exhibit 25	34
Exhibit 26	35
Exhibit 27	36
Exhibit 28	37
Exhibit 29	37
Chart 1	38
Chart 2	39
Chart 3	40
Chart 4	41
Chart 5	42
Chart 6	43

Chart 7	44
Chart 8	45
Chart 9	46
Chart 10	47
Chart 11	48
Chart 12	49
Chart 13	50
Chart 14	51
Chart 15	52
Chart 16	53
Chart 17	54

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Oregon Program Overview

Oregon operates a centralized state run biennial vehicle test program. The Inspection Maintenance (IM) Program is divided into two regions; Portland and Medford. There are approximately 1.6 million registered vehicles within the IM boundary and 2.1 million registered vehicles outside the IM boundary. 1.2 of the 1.6 million registered vehicles within the IM boundary meet the requirements for testing. Oregon has a four year grace period for new cars purchased within the state. The Portland region tests vehicles model year 1975 and newer. Medford tests vehicles up to twenty years old. Oregon conducted two test types during 2011. A Single Speed Idle test (curb idle) was conducted on 1975 to 1995 model years and an On-Board Diagnostic test was conducted on 1996 and newer model years. Oregon only charges a fee when the vehicle passes. Oregon DEQ, with cooperation from Oregon DMV, uses registration denial as its enforcement mechanism. Vehicles owned and operated within the IM boundary may not be registered without an emissions certificate of compliance.

Preface

TITLE 40 Protection of Environment
CHAPTER I Environmental Protection Agency
PART 51 Requirements for Preparation, Adoption, and Submittal of Implementation Plans
Subpart S Inspection/Maintenance Program Requirements

Sec. 51.366 Data analysis and reporting

Data analysis and reporting are required to allow for monitoring and evaluation of the program by program management and EPA, and shall provide information regarding the types of program activities performed and their final outcomes, including summary statistics and effectiveness evaluations of the enforcement mechanism, the quality assurance system, the quality control program, and the testing element. Initial submission of the following annual reports shall commence within 18 months of initial implementation of the program as required by Sec. 51.373 of this subpart. The biennial report shall commence within 30 months of initial implementation of the program as required by Sec. 51.373 of this subpart.

Test Data Report

The program shall submit to EPA by July of each year a report providing basic statistics on the testing program for January through December of the previous year, including:

(1) The Number of vehicles tested by model year and vehicle type

This information is attached as [Exhibit 1](#). Also see [Chart 1](#).

(2) By model year and vehicle type, the number and percentage of vehicles

(I) Failing initially, per test type

This information is attached as [Exhibit 2](#) and [Exhibit 3](#). Also see [Chart 2](#) and [Chart 3](#).

(II) Failing the first retest per test type

This information is attached as [Exhibit 4](#) and [Exhibit 5](#). Also see [Chart 4](#) and [Chart 5](#).

(III) Passing the first retest per test type

This information is attached as [Exhibit 6](#) and [Exhibit 7](#). Also see [Chart 6](#) and [Chart 7](#).

(IV) Initially failed vehicles passing the second or subsequent retest per test type

This information is attached as [Exhibit 8](#) and [Exhibit 9](#). Also see [Chart 8](#) and [Chart 9](#).

(V) Initially failed vehicles receiving a waiver

This section is not applicable to Oregon's program. Oregon does not waive any motorist from the vehicle emission test requirement based solely upon repair cost. Oregon's approach is to provide financial assistance, to those motorists who qualify, to facilitate the repair of their vehicle. All motorists operating a vehicle within the IM boundary are expected to pass a vehicle emission inspection with few exceptions. Oregon does offer a medical waiver to motorists with conditions prohibiting testing or making testing a hardship. A physician's letter explaining the hardship is required. Oregon offers a waiver (Form 9401) to motorists temporarily operating their vehicle in another state that does not have an emissions inspection program. If the aforementioned state does conduct vehicle testing, then Oregon requires the motorist to pass the test requirements of that state and provide proof of compliance. The new vehicle waiver allows motorists who purchase a new vehicle to transfer their existing plates from a previous vehicle to the new vehicle.

While this section is not directly applicable to Oregon, an accounting of the waivers Oregon does offer is attached as [Exhibit 29](#).

(VI) Vehicles with no known final outcome (regardless of reason)

This information is attached as [Exhibit 10](#) and [Exhibit 11](#). Also see [Chart 10](#) and [Chart 11](#).

Oregon interprets this request to mean those vehicles with no ultimate pass result during the calendar year of testing.

(VII)-(X) [Reserved]

(XI) Passing the on-board diagnostic check

This information is attached as [Exhibit 12](#) and [Exhibit 13](#). Also see [Chart 12](#) and [Chart 13](#).

(XII) Failing the on-board diagnostic check

This information is attached as [Exhibit 14](#) and [Exhibit 15](#). Also see [Chart 14](#) and [Chart 15](#).

(XIII) Failing the on-board diagnostic check and passing the tailpipe test (if applicable)

This section is no longer applicable to Oregon's program. Oregon conducted this type of data gathering in 1999 and 2000 prior to adopting OBD as a test methodology.

(XIV) Failing the on-board diagnostic check and failing the tailpipe test (if applicable)

This section is no longer applicable to Oregon's program. Oregon conducted this type of data gathering in 1999 and 2000 prior to adopting OBD as a test methodology.

(XV) Passing the on-board diagnostic check and failing the I/M gas cap evaporative system test (if applicable)

This section is not applicable to Oregon's program.

(XVI) **Failing the on-board diagnostic check and passing the I/M gas cap evaporative system test (if applicable)**

This section is not applicable to Oregon's program.

(XVII) **Passing both the on-board diagnostic check and I/M gas cap evaporative system test (if applicable)**

This section is not applicable to Oregon's program.

(XVIII) **Failing both the on-board diagnostic check and I/M gas cap evaporative system test (if applicable)**

This section is not applicable to Oregon's program.

(XIX) **MIL is commanded on and no codes are stored**

This information is attached as [Exhibit 16](#) and [Exhibit 17](#).

(XX) **MIL is not commanded on and codes are stored**

This information is attached as [Exhibit 18](#) and [Exhibit 19](#).

(XXI) **MIL is commanded on and codes are stored**

This information is attached as [Exhibit 20](#) and [Exhibit 21](#).

(XXII) **MIL is not commanded on and codes are not stored**

This information is attached as [Exhibit 22](#) and [Exhibit 23](#).

(XXIII) **Readiness status indicates that the evaluation is not complete for any module supported by on-board diagnostic systems**

This information is attached as [Exhibit 24](#) and [Exhibit 25](#). Also see [Chart 16](#) and [Chart 17](#).

(3) **The initial test volume by model year and test station**

This information is attached as [Exhibit 26](#).

(4) **The initial test failure rate by model year and test station**

This information is attached as [Exhibit 27](#).

(5) **The average increase or decrease in tailpipe emission levels for HC, CO, and NOX (if applicable) after repairs by model year and vehicle type for vehicles receiving a mass emissions test**

This section is no longer applicable to Oregon's program.

Quality Assurance Report

The program shall submit to EPA by July of each year a report providing basic statistics on the quality assurance program for January through December of the previous year, including:

(1) The number of inspection stations and lanes

(I) Operating throughout the year

Table 1 shows an accounting of Oregon's test stations and lanes.

Table 1

Station	Lane	Pos 1	Pos 2	Total
Clackamas	1	1	1	2
	2	1	1	2
	3	1	1	2
	4	1		1
	5	1	1	2
Gresham	1	1		1
	2	1	1	2
	3	1		1
	4	1		1
	5	1	1	2
Medford	1	1		1
	2	1		1
	3	1		1
Mobile-1	1	1		1
Mobile-2	1	1		1
Northeast	1	1	1	2
	2	1	1	2
	3	1	1	2
	4	1		1
Scappoose	1		1	1
Sherwood	1	1	1	2
	2	1		1
	3	1		1
	4	1		1
Sunset	1	1		1
	2	1		1
	3	1		1
	4	1		1
	5	1	1	2
	6	1		1
	7	1	1	2
	8	1	1	2
Total		31	14	45

Some of Oregon's lanes are double positioned which effectively serves as another lane since two vehicles can be queued up at one time. Oregon's Mobile stations are two mobile vans that travel to car dealerships to provide on-site testing. They are both located in Portland. Hence, Oregon has 9 stations if one counts the mobile units separately or 7 stations if one does not. Oregon has 31 physical lanes but if one counts double positioned lanes as two effective lanes then the lane count is 45. Two of these are Self-Serve OBD Test units located at the Sunset station lane 8.

i) **Operating for only part of the year**

Oregon operated all of its stations and lanes for the entire year except lane 8 at Sunset. This lane is Oregon's Self-Serve lane and has been under development off and on during the year.

(2) The number of inspection stations and lanes operating throughout the year

(I) **Receiving overt performance audits in the year**

Given that Oregon operates a state run centralized program, overt and covert audits beyond those which are automated within the software are not routinely conducted. The software conducts a calibration followed by a single gas audit every four hours in the basic Single-Speed Idle test and the OBD interface is checked as well. The software automatically shuts down lanes which fail these daily audits. Maintenance personnel conduct additional periodic audits as a part of their preventive maintenance procedures. The majority of Oregon's testing is now OBD-II which is not subject to a DEQ calibration. However, an OBD communications check is performed every four hours. This check covers CAN, ISO9141, PWM, and VPW. Maintenance personnel are also able to lockout a lane from testing if their on-site audit shows the lane is not accurate. In addition, Oregon monitors all lanes with digital surveillance cameras in order to ensure the highest level of test integrity.

(II) **Not receiving overt performance audits in the year**

See bullet (I) of this section entitled "Receiving overt performance audits in the year."

(III) **Receiving covert performance audits in the year**

See bullet (I) of this section entitled "Receiving overt performance audits in the year."

(IV) **Not receiving covert performance audits in the year**

See bullet (I) of this section entitled "Receiving overt performance audits in the year."

(V) **That have been shut down as a result of overt performance audits**

See bullet (I) of this section entitled "Receiving overt performance audits in the year."

(3) The number of covert audits

(I) **Conducted with the vehicle set to fail per test type**

See bullet (I) of section (2) entitled "Receiving overt performance audits in the year."

(II) **Conducted with the vehicle set to fail any combination of two or more test types**

See bullet (I) of section (2) entitled "Receiving overt performance audits in the year."

(III) **Resulting in a false pass per test type**

See bullet (I) of section (2) entitled "Receiving overt performance audits in the year."

(IV) **Resulting in a false pass for any combination of two or more test types**

See bullet (I) of section (2) entitled "Receiving overt performance audits in the year."

(V-VIII) **[Reserved]**

(4) The number of inspectors and stations

(I) **That were suspended, fired, or otherwise prohibited from testing as a result of covert audits**

Since Oregon's program is completely centralized, there are no covert audits in the traditional sense of other state vehicle test programs. Instead, DEQ utilizes continuous monitoring by station managers and video cameras in each testing lane.

(II) **That were suspended, fired, or otherwise prohibited from testing for other causes**

There were none during 2011.

(III) **That received fines**

This section is not applicable to Oregon's program.

(5) **The number of inspectors licensed or certified to conduct testing**

The Department of Environmental Quality has 123 Fleet Certified Inspectors that must have 8 hours of training per year to maintain their certification through DEQ's program. As of December 31, 2011, the Department of Environmental Quality employed 87 Vehicle Emission Inspectors who are certified to conduct a vehicle emission test at an Oregon Clean Air Station.

(6) **The number of hearings**

(I) **Held to consider adverse actions against inspectors and stations**

There were none during 2011.

(II) **Resulting in adverse actions against inspectors and stations**

There were none during 2011.

(7) **The total amount collected in fines from inspectors and stations by type of violation**

This section is not applicable to Oregon's program.

(8) **The total number of covert vehicles available for undercover audits over the year**

This section is not applicable to Oregon's program.

(9) **The number of covert auditors available for undercover audits**

This section is not directly applicable to Oregon's program.

See bullet (I) of section (2) entitled "Receiving overt performance audits in the year."

Quality Control Report

The program shall submit to EPA by July of each year a report providing basic statistics on the quality control program for January through December of the previous year, including:

(1) **The number of emission testing sites and lanes in use in the program**

This information is the same as that found in [Table 1](#).

(2) **The number of equipment audits by station and lane**

This section is not directly applicable to Oregon's program.

See bullet (I) of section (2) entitled "Receiving overt performance audits in the year."

(3) **The number and percentage of stations that have failed equipment audits**

This section is not directly applicable to Oregon's program.

See bullet (I) of section (2) entitled "Receiving overt performance audits in the year."

(4) **Number and percentage of stations and lanes shut down as a result of equipment audits**

This section is not directly applicable to Oregon's program.

See bullet (I) of section (2) entitled "Receiving overt performance audits in the year."

Enforcement Report

(1) All varieties of enforcement programs shall, at a minimum, submit to EPA by July of each year a report providing basic statistics on the enforcement program for January through December of the previous year, including

(I) An estimate of the number of vehicles subject to the inspection program, including the results of an analysis of the registration data base

Oregon used 2011 DMV data in order to conduct this analysis. The analysis suggests that approximately 1,221,590 vehicles were registered within Oregon's IM boundary and meet the criteria for testing. Given that Oregon operates a biennial test program, approximately 610,795 of these vehicles would be tested in 2011.

(II) The percentage of motorist compliance based upon a comparison of the number of valid final tests with the number of subject vehicles

Oregon used 2011 DMV data in order to conduct this analysis. The analysis suggests that approximately 610,795 vehicles registered in the IM boundary meet the criteria for testing during 2011. Examining DEQ's 2011 test data reveals that 597,163 initial tests were conducted in 2011. This represents 97.8% of the 610,795 vehicles expected to be tested. This analysis is a coarse estimate given the complexities involved with determining the exact number of vehicles which should be tested. The target value of 610,795 vehicles is based upon the total number of vehicles registered within testable ZIP codes that meet Oregon's test criteria. However, Oregon's IM boundary is more complicated than a simple ZIP code bounded area. Some ZIP codes are split by the I/M boundary. The total number of vehicles with final passing test results in 2011 is 588,602. This represents 98.6% of the 597,163 initially tested vehicles. Some vehicles that failed in 2011 may have passed in 2012. Hence, Oregon estimates a compliance rate of between 97.8% and 98.6%.

(III) The total number of compliance documents issued to inspection stations

This information is attached as [Exhibit 28](#).

(IV) The number of missing compliance documents

All compliance documents are accounted for at the end of each till, if there is any discrepancy or missing documents they are dealt with at that time. In the event a compliance document comes up missing, all vehicle information is reported and DEQ makes every effort to find the address and phone number of the customer to recover the missing document. There was 1 missing document situation during 2011 and the document was not recovered.

(V) The number of time extensions and other exemptions granted to motorists

Oregon issues a form 9401: Statement of vehicle outside of Oregon. This postponement is specifically for Oregon registered vehicles that require an emission certificate for registration and are currently in a state that does not offer an emissions test. In 2011, DEQ issued 716 "9401" Exemptions. Oregon also issues New Vehicle Exemptions for motorists who buy a new car within the year of the registration expiration of their old car and allows the transfer of their current plate to the new vehicle. In 2011, DEQ issued 25 New Vehicle Exemptions. For a full accounting of 9401 and other waivers see [Exhibit 29](#).

(VI) The number of compliance surveys conducted, number of vehicles surveyed in each, and the compliance rates found

This section is not applicable to Oregon's program.

(2) Registration denial based enforcement programs shall provide the following additional information

- (I) **A report of the program's efforts and actions to prevent motorists from falsely registering vehicles out of the program area or falsely changing fuel type or weight class on the vehicle registration, and the results of special studies to investigate the frequency of such activity**
The Department of Environmental Quality does not track motorists that falsely register their vehicles. All registration is completed through Oregon's Department of Motor Vehicles. Oregon's Department of Motor Vehicles is responsible for registration audits. The DMV does not provide the results of these audits to DEQ.
- (II) **The number of registration file audits, number of registrations reviewed, and compliance rates found in such audits**
Oregon's Department of Motor Vehicles is responsible for this audit. The DMV does not provide the results of these audits to DEQ. All vehicle registration is done through the Department of Motor Vehicles.

(3) Computer-matching based enforcement programs shall provide the following additional information

- (I) **The number and percentage of subject vehicles that were tested by the initial deadline, and by other milestones in the cycle**
Oregon does not currently have sufficient data to conduct this analysis.
- (II) **A report on the program's efforts to detect and enforce against motorists falsely changing vehicle classifications to circumvent program requirements, and the frequency of this type of activity**
This type of audit falls under the purview of Oregon's Department of Motor Vehicles.
- (III) **The number of enforcement system audits, and the error rate found during those audits**
This type of audit falls under the purview of Oregon's Department of Motor Vehicles.

(4) Sticker-based enforcement systems shall provide the following additional information

- (I) **A report on the program's efforts to prevent, detect, and enforce against sticker theft and counterfeiting, and the frequency of this type of activity**
This section is not applicable to Oregon's program.
- (II) **A report on the program's efforts to detect and enforce against motorists falsely changing vehicle classifications to circumvent program requirements, and the frequency of this type of activity**
This section is not applicable to Oregon's program.
- (III) **The number of parking lot sticker audits conducted, the number of vehicles surveyed in each, and the noncompliance rate found during those audits**
This section is not applicable to Oregon's program.

Additional Reporting Requirements

In addition to the annual reports in paragraphs (a) through (d) of this section, programs shall submit to EPA by July of every other year, biennial reports addressing:

(1) Any changes made in program design, funding, personnel levels, procedures, regulations, and legal authority, with detailed discussion and evaluation of the impact on the program of all such changes

The Oregon VIP made only one significant change during the year. Oregon completed its pilot study involving a self-serve OBD kiosk which allows the motorist to conduct their own vehicle test if their vehicle is 2005 or newer. The self-serve OBD lane was upgraded to include a second kiosk. The self-serve lane is now a three position environment with two self-serve kiosks and an attendant's area for customers that need assistance or are purchasing tags. Oregon is continuing its pilot study of remote OBD. DEQ has two varieties of remote OBD. The first is broadcast OBD which allows motorists to simply drive past an access point where its OBD data is downloaded and transferred to DEQ's central database. The other is record-only OBD which has a similar device installed in the vehicle, but it does not broadcast. The device is simply removed by the motorist when the test is due, interfaced with the motorist's home computer, and the data is uploaded to DEQ via an online web application. DEQ is currently piloting remote OBD with the cooperation of the Clackamas County Fleet which has volunteered 100 vehicles for the study. Two access points have been installed in Clackamas County. One is located at the maintenance depot and the other at the counties parking facility. DEQ intends to continue this study through 2012 and begin evaluating the results in 2013.

(2) Any weaknesses or problems identified in the program within the two-year reporting period, what steps have already been taken to correct those problems, the results of those steps, and any future efforts planned

Oregon previously reported the inability of our Vendor's OBD scanner to communicate properly to Multi-ECU platforms where the ECM and TCM act as autonomous units or if there are multiple ECMs. An alternate scanner was evaluated and has been deployed to all lanes during 2011. DEQ made some major software enhancements during 2011 which included certificates with embedded tags and some payment menu enhancements. DEQ also changed its self-serve kiosk environment to include three positions; two kiosks and one attendant area. These three positions are linked together via a local area network to streamline the self-serve environment. Some of the primary users of the self-serve test lane are dealers who wish to get a certificate without purchasing tags. The other primary user is the general motorist who will not use the self-serve test lane unless they can get their tags. This was the motivation for providing certificates with embedded tags. However, there is still some DMV paperwork that requires a DEQ attendant to complete a tag sale. DEQ plans some additional changes to its software in 2012. These changes will include a new payment card system which can be interfaced with DEQ's equipment while preserving its PCI compliance. Oregon's current payment card processing is dial-up and requires the inspector to enter data into two isolated systems. Oregon's integrated payment card processing will be network based and automatically populate the required data fields in our vehicle test application.

Acronyms Used in This Report

Acronym	Acronym Spelled Out	Additional Information
AND	Logic AND	To logically combine two or more bits such that the output is true only if all inputs are true.
Basic Test	See SSI	Basic test is another name for SSI.
DEQ	Department of Environmental Quality	Oregon's environmental agency responsible for maintaining Oregon's air, land, and water quality.
DLC	Data Link Connector	The connection on the vehicle through which an outboard computer is able to communicate to the vehicle's on-board computer.
DTC	Diagnostic Trouble Code	OBD codes which define a vehicle system or component fault.
ECM	Engine Control Module	An ECU that receives data from and exercises control over the engine.
ECU	Electronic Control Unit	An OBD computer network node able to make and respond to data requests via other nodes on the network. These nodes also exercise control over specific vehicle systems or components.
IM	Inspection Maintenance	A test and repair strategy whereby polluting vehicles are identified and corrected to maintain good air quality.
MIL	Malfunction Indicator Lamp	A lamp located on a vehicle's dashboard to alert the driver of an OBD fault.
OBD	Onboard Diagnostic Test.	A computerized test Implemented on vehicles model year 1996 and newer whereby the vehicles on-board computer transfers emission system/component status to an off-board computer.
OR	Logic OR	To logically combine two or more bits such that the output is true if any one of the inputs is true.
PCI	Purchase Card Industry	The purchase card industry has rigorous security standards for card readers/networks and will not reimburse losses to those merchants using card readers/networks which do not meet these rigorous standards.
PCM	Powertrain Control Module	A single ECU that receives data from and exercises control over both engine and transmission (powertrain).
SSI	Single Speed Idle Test or curb idle test.	An emission test implemented on vehicles model year 1975 to 1995 whereby tailpipe emissions are sampled while the vehicle is at its normal curb (low) idle.
TCM	Transmission Control Module	An ECU that receives data from and exercises control over the transmission.
VID	Vehicle Inspection Database.	A centralized data warehouse that transfers important test data to and from the lanes. The VID is located at DEQ's technical center.
VIP	Vehicle Inspection Program	Oregon's air quality subprogram with the sole responsibility of testing vehicle emission control systems.
VLT	Vehicle Lookup Table	A data table containing vehicle information which resides on the VID.

Exhibits and Charts

Exhibit 1

The number of vehicles tested by model year and vehicle type²⁰

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1975	170	97	173	36	476
1976	234	154	198	64	650
1977	292	216	516	110	1,134
1978	335	229	379	129	1,072
1979	493	308	313	151	1,265
1980	312	220	60	71	663
1981	426	307	105	86	924
1982	356	274	55	106	791
1983	697	433	129	151	1,410
1984	784	616	145	207	1,752
1985	1,352	955	215	324	2,846
1986	1,389	1,151	187	227	2,954
1987	2,162	1,640	278	230	4,310
1988	2,097	1,239	475	320	4,131
1989	3,672	2,360	826	575	7,433
1990	3,954	1,694	625	508	6,781
1991	6,976	3,658	865	738	12,237
1992	5,908	2,543	801	573	9,825
1993	9,285	5,687	1,530	826	17,328
1994	7,744	4,969	1,479	822	15,014
1995	12,887	7,365	2,298	1,506	24,056
1996	10,020	5,580	1,287	1,070	17,957
1997	16,429	9,372	3,778	1,973	31,552
1998	14,603	7,627	2,925	769	25,924
1999	20,514	11,918	5,720	1,986	40,138
2000	18,092	9,388	3,767	1,423	32,670
2001	23,304	12,239	5,743	1,777	43,063
2002	18,559	9,482	4,077	1,135	33,253
2003	24,553	13,400	7,401	2,019	47,373
2004	16,613	9,444	4,658	1,215	31,930
2005	25,466	15,228	7,795	1,740	50,229
2006	18,077	8,635	4,912	1,538	33,162
2007	24,963	13,812	7,587	1,494	47,856
2008	14,143	7,306	2,934	857	25,240
2009	4,934	1,571	568	216	7,289
2010	5,661	2,152	850	141	8,804
2011	1,955	966	516	97	3,534
2012	100	27	8	2	137
Total	319,511	174,262	76,178	27,212	597,163

Exhibit 2

By model year and vehicle type, the number of vehicles failing initially, per test type¹

Year	Idle				OBD				Total
	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	
1975	68	46	87	14					215
1976	101	83	106	29					319
1977	118	97	235	33					483
1978	123	113	186	27					449
1979	165	132	146	54					497
1980	78	91	28	22					219
1981	86	105	49	32					272
1982	51	83	26	35					195
1983	111	130	60	54					355
1984	144	219	54	58					475
1985	237	288	65	114					704
1986	230	321	73	76					700
1987	308	381	75	71					835
1988	311	281	97	80					769
1989	488	443	213	126					1,270
1990	492	327	149	90					1,058
1991	760	484	149	128					1,521
1992	626	305	164	79					1,174
1993	856	512	267	89					1,724
1994	550	357	281	103					1,291
1995	764	514	415	168					1,861
1996	12	2	1	58	1,137	643	157	19	2,029
1997	12	1	2	119	1,584	826	372	50	2,966
1998	5	1	1	55	1,329	608	277	1	2,277
1999				67	1,445	624	395	1	2,532
2000				37	1,418	590	254	1	2,300
2001				16	1,602	810	339	5	2,772
2002				11	1,130	606	245	2	1,994
2003				11	1,135	554	408	1	2,109
2004				5	604	297	152	1	1,059
2005				11	569	346	164	3	1,093
2006				4	377	142	87		610
2007				2	261	117	100	1	481
2008				2	80	26	17	1	126
2009				2	29	5	2	1	39
2010				1	27	3	2	2	35
2011					5	1			6
Total	6,696	5,316	2,929	1,883	12,732	6,198	2,971	89	38,814

¹ Note that some heavy-duty OBD inspections were performed. This is due to inspector error as heavy-duty vehicles are not required to be OBD-II compliant until 2013.

Exhibit 3

By model year and vehicle type, the percentage of vehicles failing initially, per test type²

Year	Idle				OBD				Total
	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	
1975	41.46%	50.00%	51.48%	41.18%					46.84%
1976	45.50%	58.87%	54.64%	47.54%					51.62%
1977	43.22%	48.50%	47.67%	30.84%					45.01%
1978	38.08%	54.07%	50.96%	21.43%					43.89%
1979	35.03%	45.52%	47.87%	36.99%					41.01%
1980	26.00%	43.54%	49.12%	32.35%					34.54%
1981	21.39%	35.84%	50.00%	39.51%					31.12%
1982	14.74%	31.80%	54.17%	35.00%					25.83%
1983	16.44%	32.34%	47.24%	37.24%					26.32%
1984	19.49%	37.37%	39.13%	29.59%					28.63%
1985	18.33%	31.75%	31.25%	36.89%					25.91%
1986	17.44%	29.59%	40.78%	34.70%					24.98%
1987	14.94%	24.50%	28.09%	32.27%					20.35%
1988	15.49%	24.27%	21.37%	25.97%					19.58%
1989	13.95%	19.68%	26.46%	22.54%					17.86%
1990	13.03%	20.55%	25.08%	18.15%					16.38%
1991	11.28%	13.70%	17.61%	17.70%					12.85%
1992	10.90%	12.42%	20.81%	14.16%					12.30%
1993	9.47%	9.21%	17.75%	10.97%					10.19%
1994	7.29%	7.37%	19.38%	12.84%					8.82%
1995	6.08%	7.10%	18.32%	11.34%					7.90%
1996	3.70%	20.00%	3.85%	6.35%	12.78%	12.60%	13.53%	16.81%	12.27%
1997	6.00%	5.88%	4.08%	7.49%	10.40%	9.42%	10.67%	14.79%	9.99%
1998	1.47%	16.67%	3.13%	7.35%	9.89%	8.45%	10.21%	14.29%	9.30%
1999				3.55%	7.37%	5.47%	7.27%	1.82%	6.59%
2000				2.69%	8.22%	6.57%	7.23%	5.00%	7.38%
2001				0.92%	7.30%	7.08%	6.36%	31.25%	6.85%
2002				1.01%	6.43%	6.79%	6.44%	11.76%	6.35%
2003				0.56%	4.80%	4.28%	5.84%	5.00%	4.63%
2004				0.43%	3.77%	3.26%	3.45%	5.56%	3.45%
2005				0.66%	2.30%	2.34%	2.20%	11.54%	2.24%
2006				0.27%	2.15%	1.70%	1.84%		1.90%
2007				0.14%	1.07%	0.87%	1.36%	4.76%	1.03%
2008				0.25%	0.59%	0.37%	0.61%	4.35%	0.52%
2009				1.00%	0.62%	0.33%	0.36%	9.09%	0.56%
2010				0.82%	0.50%	0.15%	0.24%	18.18%	0.42%
2011					0.27%	0.11%			0.18%
Total	11.09%	15.23%	25.35%	7.29%	5.18%	4.69%	4.87%	11.87%	6.78%

² This rate is a comparison of initial failures versus the sum of initial passes and failures.

Exhibit 4

By model year and vehicle type, the number of vehicles failing the first retest per test type

Year	Idle				OBD				Total
	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	
1975	5	4	8	1					18
1976	4	3	5	2					14
1977	7	5	5	3					20
1978	5	4	14	2					25
1979	10	6	5	4					25
1980	3	4	2						9
1981	4	6	6	3					19
1982	5	4	1						10
1983	3	8	5	5					21
1984	12	21	3	1					37
1985	9	14	4	9					36
1986	19	18	5	6					48
1987	22	17	2	2					43
1988	18	17	6	9					50
1989	32	32	20	9					93
1990	23	17	6	4					50
1991	48	28	6	5					87
1992	31	22	10	3					66
1993	46	29	15	5					95
1994	27	14	15	5					61
1995	38	26	25	5					94
1996				6	33	25	8	1	73
1997				4	47	24	14	4	93
1998				3	29	17	10		59
1999				2	33	9	6		50
2000				1	29	9	4		43
2001				4	25	16	4		49
2002				1	14	2			17
2003					11	8	6		25
2004					6	4	2		12
2005					2	5	1	1	9
2006					2	1	2		5
2007					2		1		3
2008					3	1			4
2009				1					1
2010					2				2
2011					1				1
Total	371	299	168	105	239	121	58	6	1,367

Exhibit 5

By model year and vehicle type, the percentage of vehicles failing the first retest per test type³

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	
1975	7.35%	8.70%	9.20%	7.14%					8.37%
1976	3.96%	3.61%	4.72%	6.90%					4.39%
1977	5.93%	5.15%	2.13%	9.09%					4.14%
1978	4.07%	3.54%	7.53%	7.41%					5.57%
1979	6.06%	4.55%	3.42%	7.41%					5.03%
1980	3.85%	4.40%	7.14%						4.11%
1981	4.65%	5.71%	12.24%	9.38%					6.99%
1982	9.80%	4.82%	3.85%						5.13%
1983	2.70%	6.15%	8.33%	9.26%					5.92%
1984	8.33%	9.59%	5.56%	1.72%					7.79%
1985	3.80%	4.86%	6.15%	7.89%					5.11%
1986	8.26%	5.61%	6.85%	7.89%					6.86%
1987	7.14%	4.46%	2.67%	2.82%					5.15%
1988	5.79%	6.05%	6.19%	11.25%					6.50%
1989	6.56%	7.22%	9.39%	7.14%					7.32%
1990	4.67%	5.20%	4.03%	4.44%					4.73%
1991	6.32%	5.79%	4.03%	3.91%					5.72%
1992	4.95%	7.21%	6.10%	3.80%					5.62%
1993	5.37%	5.66%	5.62%	5.62%					5.51%
1994	4.91%	3.92%	5.34%	4.85%					4.73%
1995	4.97%	5.06%	6.02%	2.98%					5.05%
1996				10.34%	2.90%	3.89%	5.10%	5.26%	3.60%
1997				3.36%	2.97%	2.91%	3.76%	8.00%	3.14%
1998				5.45%	2.18%	2.80%	3.61%		2.59%
1999				2.99%	2.28%	1.44%	1.52%		1.97%
2000				2.70%	2.05%	1.53%	1.57%		1.87%
2001				25.00%	1.56%	1.98%	1.18%		1.77%
2002				9.09%	1.24%	0.33%			0.85%
2003					0.97%	1.44%	1.47%		1.19%
2004					0.99%	1.35%	1.32%		1.13%
2005					0.35%	1.45%	0.61%	33.33%	0.82%
2006					0.53%	0.70%	2.30%		0.82%
2007					0.77%		1.00%		0.62%
2008					3.75%	3.85%			3.17%
2009				50.00%	0.00%				2.56%
2010					7.41%				5.71%
2011					20.00%				16.67%
Total	5.54%	5.62%	5.74%	5.58%	1.88%	1.95%	1.95%	6.74%	3.52%

³ This rate is a comparison of retest failures versus total initial failures.

Exhibit 6

By model year and vehicle type, the number of vehicles passing the first retest per test type

Year	Idle				OBD				Total
	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	
1975	21	15	31	9					76
1976	29	28	35	4					96
1977	32	26	76	11					145
1978	39	32	50	10					131
1979	55	45	43	15					158
1980	28	33	6	6					73
1981	25	31	19	9					84
1982	22	28	10	9					69
1983	40	44	12	12					108
1984	50	73	14	24					161
1985	92	115	23	40					270
1986	91	116	25	19					251
1987	128	146	30	23					327
1988	129	107	44	32					312
1989	212	187	88	50					537
1990	198	129	56	42					425
1991	329	201	74	60					664
1992	292	129	69	40					530
1993	401	252	129	46					828
1994	244	178	127	52					601
1995	384	247	198	87					916
1996	8	1		26	463	242	71	7	818
1997	7			49	693	370	147	20	1,286
1998	2			25	612	272	109		1,020
1999				37	707	331	195	1	1,271
2000				23	757	289	138	1	1,208
2001				8	786	367	137	2	1,300
2002				8	564	289	108	1	970
2003				8	607	285	220		1,120
2004				2	265	170	87	1	525
2005				8	305	213	95	2	623
2006				2	221	82	44		349
2007				1	160	78	51		290
2008				2	35	11	4	1	53
2009				1	10	4	1		16
2010				1	13	1	2		17
2011					3				3
Total	2,858	2,163	1,159	801	6,201	3,004	1,409	36	17,631

Exhibit 7

By model year and vehicle type, the percentage of vehicles passing the first retest per test type⁴

Year	Idle				OBD				Total
	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	
1975	30.88%	32.61%	35.63%	64.29%					35.35%
1976	28.71%	33.73%	33.02%	13.79%					30.09%
1977	27.12%	26.80%	32.34%	33.33%					30.02%
1978	31.71%	28.32%	26.88%	37.04%					29.18%
1979	33.33%	34.09%	29.45%	27.78%					31.79%
1980	35.90%	36.26%	21.43%						33.33%
1981	29.07%	29.52%	38.78%	28.13%					30.88%
1982	43.14%	33.73%	38.46%						35.38%
1983	36.04%	33.85%	20.00%	22.22%					30.42%
1984	34.72%	33.33%	25.93%	41.38%					33.89%
1985	38.82%	39.93%	35.38%	35.09%					38.35%
1986	39.57%	36.14%	34.25%	25.00%					35.86%
1987	41.56%	38.32%	40.00%	32.39%					39.16%
1988	41.48%	38.08%	45.36%	40.00%					40.57%
1989	43.44%	42.21%	41.31%	39.68%					42.28%
1990	40.24%	39.45%	37.58%	46.67%					40.17%
1991	43.29%	41.53%	49.66%	46.88%					43.66%
1992	46.65%	42.30%	42.07%	50.63%					45.14%
1993	46.85%	49.22%	48.31%	51.69%					48.03%
1994	44.36%	49.86%	45.20%	50.49%					46.55%
1995	50.26%	48.05%	47.71%	51.79%					49.22%
1996				44.83%	40.72%	37.64%	45.22%	36.84%	40.32%
1997				41.18%	43.75%	44.79%	39.52%	40.00%	43.36%
1998				45.45%	46.05%	44.74%	39.35%		44.80%
1999				55.22%	48.93%	53.04%	49.37%		50.20%
2000				62.16%	53.39%	48.98%	54.33%		52.52%
2001				50.00%	49.06%	45.31%	40.41%		46.90%
2002				72.73%	49.91%	47.69%			48.65%
2003					53.48%	51.44%	53.92%		53.11%
2004					43.87%	57.24%	57.24%		49.58%
2005					53.60%	61.56%	57.93%	66.67%	57.00%
2006					58.62%	57.75%	50.57%		57.21%
2007					61.30%		51.00%		60.29%
2008					43.75%	42.31%			42.06%
2009				50.00%	34.48%				41.03%
2010					48.15%				48.57%
2011					60.00%				50.00%
Total	42.68%	40.69%	39.57%	42.54%	48.70%	48.47%	47.43%	40.45%	45.42%

⁴ This rate is a comparison of first retest passes versus initial failures.

Exhibit 8

By model year and vehicle type, the number of initially failed vehicles passing the second or subsequent retest per test type⁵

Year	Idle				OBD				Total
	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	
1975	18	17	27	3					65
1976	38	27	41	11					117
1977	47	37	89	4					177
1978	49	53	68	6					176
1979	65	40	59	19					183
1980	26	29	12	10					77
1981	21	41	13	11					86
1982	12	30	10	15					67
1983	34	42	27	17					120
1984	44	70	23	16					153
1985	60	102	21	39					222
1986	57	95	25	26					203
1987	72	129	25	21					247
1988	73	81	25	18					197
1989	125	127	59	35					346
1990	128	94	50	26					298
1991	201	149	43	44					437
1992	161	86	41	17					305
1993	234	128	74	22					458
1994	143	78	89	24					334
1995	189	150	137	49					525
1996	1			16	287	187	30	5	526
1997	3	1	1	45	412	233	99	9	803
1998	2	1	1	13	306	151	75		549
1999				18	364	158	105		645
2000				9	291	146	65		511
2001				3	474	260	125	1	863
2002				1	300	200	91		592
2003				1	314	172	127	1	615
2004				3	184	73	33		293
2005				2	147	82	50		281
2006				1	74	33	29		137
2007				1	56	28	34	1	120
2008					22	5	11		38
2009					10	1	1		12
2010					10			1	11
2011						1			1
Total	1,803	1,607	960	546	3,251	1,730	875	18	10,790

⁵ Only vehicles failing during calendar year 2011 and then ultimately passing prior to January 2012 are used in this analysis.

Exhibit 9

By model year and vehicle type, the percentage of initially failed vehicles passing the second or subsequent retest per test type⁶

Year	Idle				OBD				Total
	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	
1975	26.47%	36.96%	31.03%	21.43%					30.23%
1976	37.62%	32.53%	38.68%	37.93%					36.68%
1977	39.83%	38.14%	37.87%	12.12%					36.65%
1978	39.84%	46.90%	36.56%	22.22%					39.20%
1979	39.39%	30.30%	40.41%	35.19%					36.82%
1980	33.33%	31.87%	42.86%						35.16%
1981	24.42%	39.05%	26.53%	34.38%					31.62%
1982	23.53%	36.14%	38.46%						34.36%
1983	30.63%	32.31%	45.00%	31.48%					33.80%
1984	30.56%	31.96%	42.59%	27.59%					32.21%
1985	25.32%	35.42%	32.31%	34.21%					31.53%
1986	24.78%	29.60%	34.25%	34.21%					29.00%
1987	23.38%	33.86%	33.33%	29.58%					29.58%
1988	23.47%	28.83%	25.77%	22.50%					25.62%
1989	25.61%	28.67%	27.70%	27.78%					27.24%
1990	26.02%	28.75%	33.56%	28.89%					28.17%
1991	26.45%	30.79%	28.86%	34.38%					28.73%
1992	25.72%	28.20%	25.00%	21.52%					25.98%
1993	27.34%	25.00%	27.72%	24.72%					26.57%
1994	26.00%	21.85%	31.67%	23.30%					25.87%
1995	24.74%	29.18%	33.01%	29.17%					28.21%
1996				27.59%	25.24%	29.08%	19.11%	26.32%	25.92%
1997				37.82%	26.01%	28.21%	26.61%	18.00%	27.07%
1998				23.64%	23.02%	24.84%	27.08%		24.11%
1999				26.87%	25.19%	25.32%	26.58%		25.47%
2000				24.32%	20.52%	24.75%	25.59%		22.22%
2001				18.75%	29.59%	32.10%	36.87%		31.13%
2002				9.09%	26.55%	33.00%			29.69%
2003					27.67%	31.05%	31.13%		29.16%
2004					30.46%	24.58%	21.71%		27.67%
2005					25.83%	23.70%	30.49%	0.00%	25.71%
2006					19.63%	23.24%	33.33%		22.46%
2007					21.46%		34.00%		24.95%
2008					27.50%	19.23%			30.16%
2009				0.00%	34.48%				30.77%
2010					37.04%				31.43%
2011					0.00%				16.67%
Total	26.93%	30.23%	32.78%	29.00%	25.53%	27.91%	29.45%	20.22%	27.80%

⁶ This rate is a comparison of second or subsequent retest passes versus initial failures. To find the rate of ultimate passes, add Exhibit 7 and Exhibit 9 together.

Exhibit 10

By model year and vehicle type, the number of initially failed vehicles with no known final outcome (regardless of reason)⁷

Year	Idle				OBD				Total
	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	
1975	13	8	16	1					38
1976	14	9	10	5					38
1977	19	12	29	6					66
1978	16	10	31	3					60
1979	20	22	17	9					68
1980	11	12	3	2					28
1981	9	13	10	3					35
1982	7	11	3	5					26
1983	8	22	11	8					49
1984	24	32	4	2					62
1985	29	27	8	16					80
1986	39	44	7	13					103
1987	43	37	6	4					90
1988	37	30	14	16					97
1989	62	54	37	17					170
1990	60	35	15	8					118
1991	110	52	14	11					187
1992	63	38	18	8					127
1993	89	53	24	7					173
1994	60	27	27	8					122
1995	80	44	42	13					179
1996	1			11	109	64	23	1	209
1997	1			9	148	78	40	10	286
1998	1			10	115	62	33		221
1999				4	110	31	30		175
2000				1	97	43	16		157
2001				4	99	57	29		189
2002				1	74	32	10		117
2003					52	28	25		105
2004					37	18	8		63
2005					23	15	10	1	49
2006					20	4	5		29
2007					12	3	4		19
2008					6	3			9
2009				1	1			1	3
2010					2			1	3
2011					2				2
Total	816	592	346	206	907	438	233	14	3,552

⁷ Only vehicles failing during calendar year 2011 and without an ultimate pass prior to January 2012 are used in this analysis. Assumes 'known final outcome' means an ultimate pass result.

Exhibit 11

By model year and vehicle type, the percentage of initially failed vehicles with no known final outcome (regardless of reason)^{7, 8}

Year	Idle				OBD				Total
	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	
1975	19.12%	17.39%	18.39%	7.14%					17.67%
1976	13.86%	10.84%	9.43%	17.24%					11.91%
1977	16.10%	12.37%	12.34%	18.18%					13.66%
1978	13.01%	8.85%	16.67%	11.11%					13.36%
1979	12.12%	16.67%	11.64%	16.67%					13.68%
1980	14.10%	13.19%	10.71%						12.79%
1981	10.47%	12.38%	20.41%	9.38%					12.87%
1982	13.73%	13.25%	11.54%						13.33%
1983	7.21%	16.92%	18.33%	14.81%					13.80%
1984	16.67%	14.61%	7.41%	3.45%					13.05%
1985	12.24%	9.38%	12.31%	14.04%					11.36%
1986	16.96%	13.71%	9.59%	17.11%					14.71%
1987	13.96%	9.71%	8.00%	5.63%					10.78%
1988	11.90%	10.68%	14.43%	20.00%					12.61%
1989	12.70%	12.19%	17.37%	13.49%					13.39%
1990	12.20%	10.70%	10.07%	8.89%					11.15%
1991	14.47%	10.74%	9.40%	8.59%					12.29%
1992	10.06%	12.46%	10.98%	10.13%					10.82%
1993	10.40%	10.35%	8.99%	7.87%					10.03%
1994	10.91%	7.56%	9.61%	7.77%					9.45%
1995	10.47%	8.56%	10.12%	7.74%					9.62%
1996				18.97%	9.59%	9.95%	14.65%	5.26%	10.30%
1997				7.56%	9.34%	9.44%	10.75%	20.00%	9.64%
1998				18.18%	8.65%	10.20%	11.91%		9.71%
1999				5.97%	7.61%	4.97%	7.59%		6.91%
2000				2.70%	6.84%	7.29%	6.30%		6.83%
2001				25.00%	6.18%	7.04%	8.55%		6.82%
2002				9.09%	6.55%	5.28%			5.87%
2003					4.58%	5.05%	6.13%		4.98%
2004					6.13%	6.06%	5.26%		5.95%
2005					4.04%	4.34%	6.10%	33.33%	4.48%
2006					5.31%	2.82%	5.75%		4.75%
2007					4.60%		4.00%		3.95%
2008					7.50%	11.54%			7.14%
2009				50.00%	3.45%				7.69%
2010					7.41%				8.57%
2011					40.00%				33.33%
Total	12.19%	11.14%	11.81%	10.94%	7.12%	7.07%	7.84%	15.73%	9.15%

⁸ This rate is a comparison of ultimate non-passes versus initial failures. This includes vehicles that ultimately are OBD Not-Ready.

Exhibit 12

By model year and vehicle type, the number passing the on-board diagnostic check⁹

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	7,757	4,460	1,003	94	13,314
1997	13,653	7,941	3,113	288	24,995
1998	12,106	6,585	2,436	6	21,133
1999	18,164	10,774	5,037	54	34,029
2000	15,830	8,396	3,258	19	27,503
2001	20,342	10,636	4,993	11	35,982
2002	16,443	8,321	3,562	15	28,341
2003	22,488	12,383	6,576	19	41,466
2004	15,409	8,827	4,258	17	28,511
2005	24,211	14,420	7,300	23	45,954
2006	17,132	8,207	4,630	48	30,017
2007	24,136	13,362	7,262	20	44,780
2008	13,574	7,046	2,784	22	23,426
2009	4,677	1,501	548	10	6,736
2010	5,329	2,043	815	9	8,196
2011	1,828	890	468	6	3,192
2012	95	27	5		127
Total	233,174	125,819	58,048	661	417,702

Exhibit 13

By model year and vehicle type, the percentage passing the on-board diagnostic check¹⁰

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	87.22%	87.40%	86.47%	83.19%	87.19%
1997	89.60%	90.58%	89.33%	85.21%	89.82%
1998	90.11%	91.55%	89.79%	85.71%	90.51%
1999	92.63%	94.53%	92.73%	98.18%	93.25%
2000	91.78%	93.43%	92.77%	95.00%	92.40%
2001	92.70%	92.92%	93.64%	68.75%	92.89%
2002	93.57%	93.21%	93.56%	88.24%	93.46%
2003	95.20%	95.72%	94.16%	95.00%	95.18%
2004	96.23%	96.74%	96.55%	94.44%	96.43%
2005	97.70%	97.66%	97.80%	88.46%	97.70%
2006	97.85%	98.30%	98.16%	100.00%	98.02%
2007	98.93%	99.13%	98.64%	95.24%	98.94%
2008	99.41%	99.63%	99.39%	95.65%	99.47%
2009	99.38%	99.67%	99.64%	90.91%	99.45%
2010	99.50%	99.85%	99.76%	81.82%	99.59%
2011	99.73%	99.89%	100.00%	100.00%	99.81%
2012	100.00%	100.00%	100.00%		100.00%
Total	94.82%	95.31%	95.13%	88.13%	95.00%

⁹ Note that some heavy-duty OBD inspections were performed. This is due to inspector error as heavy-duty vehicles are not required to be OBD-II compliant until 2013.

¹⁰ This rate is a comparison of initial OBD pass versus the sum of initial OBD pass and fail.

Exhibit 14

By model year and vehicle type, the number failing the on-board diagnostic check

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	1,137	643	157	19	1,956
1997	1,584	826	372	50	2,832
1998	1,329	608	277	1	2,215
1999	1,445	624	395	1	2,465
2000	1,418	590	254	1	2,263
2001	1,602	810	339	5	2,756
2002	1,130	606	245	2	1,983
2003	1,135	554	408	1	2,098
2004	604	297	152	1	1,054
2005	569	346	164	3	1,082
2006	377	142	87		606
2007	261	117	100	1	479
2008	80	26	17	1	124
2009	29	5	2	1	37
2010	27	3	2	2	34
2011	5	1			6
2012					
Total	12,732	6,198	2,971	89	21,990

Exhibit 15

By model year and vehicle type, the percentage failing the on-board diagnostic check¹¹

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	12.78%	12.60%	13.53%	16.81%	12.81%
1997	10.40%	9.42%	10.67%	14.79%	10.18%
1998	9.89%	8.45%	10.21%	14.29%	9.49%
1999	7.37%	5.47%	7.27%	1.82%	6.75%
2000	8.22%	6.57%	7.23%	5.00%	7.60%
2001	7.30%	7.08%	6.36%	31.25%	7.11%
2002	6.43%	6.79%	6.44%	11.76%	6.54%
2003	4.80%	4.28%	5.84%	5.00%	4.82%
2004	3.77%	3.26%	3.45%	5.56%	3.57%
2005	2.30%	2.34%	2.20%	11.54%	2.30%
2006	2.15%	1.70%	1.84%	0.00%	1.98%
2007	1.07%	0.87%	1.36%	4.76%	1.06%
2008	0.59%	0.37%	0.61%	4.35%	0.53%
2009	0.62%	0.33%	0.36%	9.09%	0.55%
2010	0.50%	0.15%	0.24%	18.18%	0.41%
2011	0.27%	0.11%	0.00%	0.00%	0.19%
2012	0.00%	0.00%	0.00%		0.00%
Total	5.18%	4.69%	4.87%	11.87%	5.00%

¹¹ This rate is a comparison of initial fail versus the sum of initial pass and fail. IM measured OBD failure rates are lower than actual failure rates due to the motorist feedback provided by OBD. A dashboard MIL illumination is a strong indicator of failure and many motorists will seek a repair to extinguish the MIL prior to visiting DEQ for their initial test. This is a major improvement over previous test methodologies as it provides the motorist a greater degree of awareness and control over their vehicle's emissions.

Exhibit 16

By model year and vehicle type, the number where MIL is commanded on and no codes are stored

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	4	3			7
1997	3				3
1998	4	1			5
1999	10	1	2		13
2000	2	2	2		6
2001	4	2	2		8
2002	4	3			7
2003	6	12	3		21
2004	1	2			3
2005	1	3		1	5
2006	1	3			4
2007		2			2
2008					
2009					
2010					
2011					
2012					
Total	40	34	9	1	84

Exhibit 17

By model year and vehicle type, the percentage where MIL is commanded on and no codes are stored¹²

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	0.04%	0.06%			0.05%
1997	0.02%				0.01%
1998	0.03%	0.01%			0.02%
1999	0.05%	0.01%	0.04%		0.04%
2000	0.01%	0.02%	0.06%		0.02%
2001	0.02%	0.02%	0.04%		0.02%
2002	0.02%	0.03%			0.02%
2003	0.03%	0.09%	0.04%		0.05%
2004	0.01%	0.02%			0.01%
2005	0.00%	0.02%		3.85%	0.01%
2006	0.01%	0.04%			0.01%
2007		0.01%			0.00%
2008					0.00%
2009					0.00%
2010					0.00%
2011					0.00%
2012					0.00%
Total	0.02%	0.03%	0.01%	0.13%	0.02%

¹² This rate is a comparison of initial MIL with no DTC versus the sum of initial pass and fail. Oregon considers a MIL command without a stored DTC an OBD failure.

Exhibit 18

By model year and vehicle type, the number where MIL is not commanded on and codes are stored

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	881	610	137	6	1,634
1997	1,384	1,065	282	29	2,760
1998	1,248	786	209		2,243
1999	1,851	979	435	6	3,271
2000	1,691	1,091	223	4	3,009
2001	2,537	1,024	287	2	3,850
2002	1,724	929	239	2	2,894
2003	1,912	1,311	375	2	3,600
2004	1,194	891	237	1	2,323
2005	1,625	1,002	383	3	3,013
2006	1,142	528	348	11	2,029
2007	1,251	769	354	6	2,380
2008	769	357	164	7	1,297
2009	355	92	51		498
2010	431	173	82	5	691
2011	119	41	26	2	188
2012	3	1			4
Total	20,117	11,649	3,832	86	35,684

Exhibit 19

By model year and vehicle type, the percentage where MIL is not commanded on and codes are stored¹³

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	9.91%	11.95%	11.81%	5.31%	10.70%
1997	9.08%	12.15%	8.09%	8.58%	9.92%
1998	9.29%	10.93%	7.70%		9.61%
1999	9.44%	8.59%	8.01%	10.91%	8.96%
2000	9.80%	12.14%	6.35%	20.00%	10.11%
2001	11.56%	8.95%	5.38%	12.50%	9.94%
2002	9.81%	10.41%	6.28%	11.76%	9.54%
2003	8.09%	10.13%	5.37%	10.00%	8.26%
2004	7.46%	9.77%	5.37%	5.56%	7.86%
2005	6.56%	6.79%	5.13%	11.54%	6.41%
2006	6.52%	6.32%	7.38%	22.92%	6.63%
2007	5.13%	5.71%	4.81%	28.57%	5.26%
2008	5.63%	5.05%	5.86%	30.43%	5.51%
2009	7.54%	6.11%	9.27%		7.35%
2010	8.05%	8.46%	10.04%	45.45%	8.40%
2011	6.49%	4.60%	5.56%	33.33%	5.88%
2012	3.16%	3.70%			3.15%
Total	8.18%	8.82%	6.28%	11.47%	8.12%

¹³ This rate is a comparison of initial MIL not commanded with DTC versus the sum of initial pass and fail. These represent historical or pending codes and therefore Oregon does not consider a stored DTC without a MIL command an OBD failure.

Exhibit 20

By model year and vehicle type, the number where MIL is commanded on and codes are stored

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	1,063	606	152	16	1,837
1997	1,508	813	362	46	2,729
1998	1,249	587	273	1	2,110
1999	1,359	591	377	1	2,328
2000	1,336	553	229		2,118
2001	1,517	789	312	4	2,622
2002	1,094	585	229	1	1,909
2003	1,086	525	307		1,918
2004	574	278	120	1	973
2005	541	326	131		998
2006	337	133	72		542
2007	239	102	93	1	435
2008	67	20	15	1	103
2009	19	5	2		26
2010	16	3	1		20
2011	3	1			4
2012					
Total	12,008	5,917	2,675	72	20,672

Exhibit 21

By model year and vehicle type, the percentage where MIL is commanded on and codes are stored¹⁴

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	11.95%	11.88%	13.10%	14.16%	12.03%
1997	9.90%	9.27%	10.39%	13.61%	9.81%
1998	9.30%	8.16%	10.06%	14.29%	9.04%
1999	6.93%	5.19%	6.94%	1.82%	6.38%
2000	7.75%	6.15%	6.52%	0.00%	7.12%
2001	6.91%	6.89%	5.85%	25.00%	6.77%
2002	6.23%	6.55%	6.02%	5.88%	6.30%
2003	4.60%	4.06%	4.40%		4.40%
2004	3.58%	3.05%	2.72%	5.56%	3.29%
2005	2.18%	2.21%	1.76%		2.12%
2006	1.92%	1.59%	1.53%		1.77%
2007	0.98%	0.76%	1.26%	4.76%	0.96%
2008	0.49%	0.28%	0.54%	4.35%	0.44%
2009	0.40%	0.33%	0.36%		0.38%
2010	0.30%	0.15%	0.12%		0.24%
2011	0.16%	0.11%			0.13%
2012					0.00%
Total	4.88%	4.48%	4.38%	9.60%	4.70%

¹⁴ This rate is a comparison of initial MIL commanded on with DTC versus the sum of initial pass and fail. This represents the majority of OBD failures. However, other failures include communication, connector, and handheld OBD scanner failures.

Exhibit 22

By model year and vehicle type, the number where MIL is not commanded on and codes are not stored

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	6,927	3,871	867	91	11,756
1997	12,313	6,883	2,834	262	22,292
1998	10,905	5,812	2,227	6	18,950
1999	16,352	9,805	4,607	48	30,812
2000	14,188	7,321	3,038	15	24,562
2001	17,846	9,618	4,708	9	32,181
2002	14,735	7,398	3,325	13	25,471
2003	20,605	11,075	6,266	17	37,963
2004	14,233	7,937	4,022	16	26,208
2005	22,596	13,420	6,918	20	42,954
2006	16,009	7,680	4,282	37	28,008
2007	22,896	12,594	6,908	14	42,412
2008	12,815	6,691	2,621	15	22,142
2009	4,330	1,409	497	10	6,246
2010	4,906	1,870	733	4	7,513
2011	1,709	849	442	4	3,004
2012	92	26	5		123
Total	213,457	114,259	54,300	581	382,597

Exhibit 23

By model year and vehicle type, the percentage where MIL is not commanded on and codes are not stored¹⁵

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	77.88%	75.86%	74.74%	80.53%	76.99%
1997	80.81%	78.51%	81.32%	77.51%	80.11%
1998	81.17%	80.80%	82.09%	85.71%	81.16%
1999	83.39%	86.02%	84.81%	87.27%	84.43%
2000	82.26%	81.47%	86.50%	75.00%	82.52%
2001	81.33%	84.03%	88.30%	56.25%	83.07%
2002	83.85%	82.87%	87.34%	76.47%	84.00%
2003	87.22%	85.61%	89.72%	85.00%	87.14%
2004	88.88%	86.99%	91.20%	88.89%	88.65%
2005	91.19%	90.88%	92.68%	76.92%	91.32%
2006	91.43%	91.99%	90.78%	77.08%	91.46%
2007	93.85%	93.43%	93.83%	66.67%	93.71%
2008	93.86%	94.61%	93.57%	65.22%	94.02%
2009	92.01%	93.56%	90.36%	90.91%	92.22%
2010	91.60%	91.40%	89.72%	36.36%	91.29%
2011	93.24%	95.29%	94.44%	66.67%	93.93%
2012	96.84%	96.30%	100.00%		96.85%
Total	86.80%	86.55%	88.99%	77.47%	87.01%

¹⁵ This rate is a comparison of initial no MIL command and no DTC versus the sum of initial pass and fail. This represents the majority of those vehicles passing OBD. However, some vehicles have one but not both while others were handheld tested. Handheld OBD scanner tests only have the final outcome field (OBD result) stored in the database.

Exhibit 24

By model year and vehicle type, the number where readiness status indicates that the evaluation is not complete for any module supported by on-board diagnostic systems

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	590	378	62	7	1,037
1997	762	459	151	7	1,379
1998	608	322	124	3	1,057
1999	673	346	182	4	1,205
2000	587	277	156	3	1,023
2001	1,095	657	300	5	2,057
2002	805	437	192	2	1,436
2003	718	316	228	8	1,270
2004	448	227	153	3	831
2005	452	306	186	7	951
2006	398	196	115	7	716
2007	396	219	146	3	764
2008	386	178	112	3	679
2009	194	58	16	2	270
2010	275	95	26	1	397
2011	101	65	47		213
2012	3		3		6
Total	8,491	4,536	2,199	65	15,291

Exhibit 25

By model year and vehicle type, the percentage where readiness status indicates that the evaluation is not complete for any module supported by on-board diagnostic systems¹⁶

Year	Passenger	Light-Duty	Medium-Duty	Heavy-Duty	Total
1996	6.22%	6.90%	5.07%	5.83%	6.36%
1997	4.76%	4.98%	4.15%	2.03%	4.72%
1998	4.33%	4.28%	4.37%	30.00%	4.33%
1999	3.32%	2.95%	3.24%	6.78%	3.20%
2000	3.29%	2.99%	4.25%	13.04%	3.32%
2001	4.75%	5.43%	5.33%	23.81%	5.04%
2002	4.38%	4.67%	4.80%	10.53%	4.52%
2003	2.95%	2.38%	3.16%	28.57%	2.83%
2004	2.72%	2.43%	3.35%	14.29%	2.73%
2005	1.79%	2.03%	2.43%	21.21%	1.98%
2006	2.22%	2.29%	2.38%	12.73%	2.28%
2007	1.60%	1.60%	1.94%	12.50%	1.66%
2008	2.75%	2.46%	3.84%	11.54%	2.80%
2009	3.96%	3.71%	2.83%	15.38%	3.83%
2010	4.88%	4.44%	3.08%	8.33%	4.60%
2011	5.22%	6.80%	9.13%		6.24%
2012	3.06%		37.50%		4.51%
Total	3.34%	3.32%	3.48%	7.98%	3.36%

¹⁶ This rate is a comparison of initial not-ready versus the sum of initial pass, fail, and not-ready. Oregon allows 2 monitors not-ready for 1996 to 2000 model years and only 1 monitor not-ready for model year 2001 and newer. Diesels are allowed no monitors not-ready through 2008 model year and 1 monitor not-ready for 2009 and newer. Early OBD diesels have very few monitors supported.

Exhibit 26

The initial test volume by model year and test station¹⁷

Year	Clackamas	Gresham	Medford	Mobile-1	Mobile-2	Northeast	Scappoose	Sherwood	Sunset	Total
1975	132	93				103	9	56	83	476
1976	167	118				144	9	96	116	650
1977	307	248				207	26	133	213	1,134
1978	297	212	1			216	20	116	210	1,072
1979	339	248	1			240	22	173	242	1,265
1980	169	120	2			145	12	77	138	663
1981	248	170				203	16	115	172	924
1982	194	158	1			216	12	78	132	791
1983	358	262	2			302	20	187	279	1,410
1984	430	313	3			391	29	211	375	1,752
1985	732	551	5			605	42	336	575	2,846
1986	714	581	5			618	43	359	634	2,954
1987	1,096	857	13			953	52	490	849	4,310
1988	1,022	846	13			818	51	522	859	4,131
1989	1,844	1,566	36			1,404	118	952	1,513	7,433
1990	1,617	1,407	86			1,344	64	833	1,430	6,781
1991	2,599	2,269	1,453			2,020	124	1,416	2,356	12,237
1992	2,039	1,859	1,203	1		1,547	84	1,163	1,929	9,825
1993	3,630	3,281	1,801			2,850	194	2,095	3,477	17,328
1994	3,104	2,731	1,791			2,466	155	1,817	2,950	15,014
1995	4,980	4,450	2,563	1		3,892	216	3,026	4,928	24,056
1996	3,634	3,236	1,910	14	18	3,013	135	2,100	3,897	17,957
1997	6,141	5,555	3,131	27	38	4,929	269	4,325	7,137	31,552
1998	5,084	4,511	2,679	37	42	4,238	179	3,404	5,750	25,924
1999	7,836	6,561	3,841	65	66	6,141	331	5,975	9,322	40,138
2000	6,190	5,269	3,470	92	78	5,198	207	4,653	7,513	32,670
2001	8,153	6,668	4,265	110	78	6,312	302	6,870	10,305	43,063
2002	6,156	5,030	3,560	151	131	5,048	218	5,147	7,812	33,253
2003	8,988	7,037	4,870	221	228	6,818	380	7,493	11,338	47,373
2004	5,862	4,619	3,376	335	315	4,639	191	5,048	7,545	31,930
2005	9,484	7,057	4,752	458	420	6,916	367	8,668	12,107	50,229
2006	6,007	4,513	3,340	666	564	4,629	245	5,486	7,712	33,162
2007	8,655	6,453	4,247	873	802	6,302	343	8,459	11,722	47,856
2008	4,113	3,112	2,380	1,137	1,051	3,519	162	3,951	5,815	25,240
2009	1,096	736	859	649	514	1,008	39	888	1,500	7,289
2010	1,249	697	1,285	1,176	1,017	973	42	978	1,387	8,804
2011	432	259	455	443	505	398	13	420	609	3,534
2012	13	15	11	16	21	13		19	29	137
Total	115,111	93,668	57,410	6,472	5,888	90,778	4,741	88,135	134,960	597,163

¹⁷ Oregon's Medford station only tests the first 20 model years and Oregon's Mobile units only perform the OBD test which is applicable to 1996 and newer vehicles.

Exhibit 27

The initial test failure rate by model year and test station¹⁸

Year	Clackamas	Gresham	Medford	Mobile-1	Mobile-2	Northeast	Scappoose	Sherwood	Sunset	Total
1975	48.80%	54.95%				45.00%	25.00%	47.27%	38.75%	46.84%
1976	49.69%	54.05%				50.00%	62.50%	61.96%	44.64%	51.62%
1977	42.71%	45.96%				45.60%	38.46%	45.97%	47.00%	45.01%
1978	41.75%	49.00%				44.66%	63.16%	45.54%	38.31%	43.89%
1979	41.59%	44.44%				38.70%	38.10%	38.46%	41.13%	41.01%
1980	32.08%	39.66%				30.50%	27.27%	36.49%	37.40%	34.54%
1981	34.32%	34.78%				28.04%	56.25%	23.85%	28.83%	31.12%
1982	30.65%	28.67%	100.00%			23.53%		22.67%	22.83%	25.83%
1983	25.15%	32.67%				23.21%	31.58%	19.89%	29.32%	26.32%
1984	29.06%	32.44%				25.21%	37.04%	25.74%	29.63%	28.63%
1985	25.98%	26.73%				23.60%	20.51%	23.84%	29.09%	25.91%
1986	26.24%	21.34%	50.00%			23.58%	24.39%	23.39%	28.97%	24.98%
1987	21.26%	20.25%	66.67%			19.67%	20.00%	17.12%	21.76%	20.35%
1988	17.13%	18.36%				20.77%	30.43%	18.85%	22.50%	19.58%
1989	17.95%	18.59%	50.00%			14.39%	18.35%	17.43%	20.28%	17.86%
1990	16.63%	15.35%	25.93%			14.92%	19.35%	16.67%	18.01%	16.38%
1991	11.75%	13.80%	9.87%			13.38%	9.48%	11.99%	15.23%	12.85%
1992	10.22%	13.37%	9.84%			12.43%	8.75%	11.88%	15.34%	12.30%
1993	9.75%	9.89%	9.02%			9.63%	8.51%	9.55%	12.49%	10.19%
1994	7.38%	10.11%	7.64%			8.44%	6.76%	7.79%	10.91%	8.82%
1995	7.16%	7.76%	7.01%			7.19%	4.88%	7.56%	10.16%	7.90%
1996	11.70%	14.30%	12.27%	18.18%	9.09%	13.38%	12.10%	9.71%	11.66%	12.27%
1997	9.64%	11.19%	10.74%	4.55%	14.29%	10.87%	12.80%	8.76%	9.10%	9.99%
1998	8.83%	10.32%	9.67%	6.06%	2.94%	9.85%	6.17%	8.51%	9.00%	9.30%
1999	6.46%	8.03%	7.16%	5.36%	5.66%	6.96%	6.19%	5.44%	6.02%	6.59%
2000	6.75%	8.61%	7.10%	6.10%	6.25%	8.18%	8.25%	7.25%	6.71%	7.38%
2001	6.32%	7.88%	7.52%	10.59%	5.08%	7.40%	9.32%	6.18%	6.35%	6.85%
2002	6.19%	7.14%	6.41%	5.13%	4.00%	7.03%	6.53%	5.84%	5.89%	6.35%
2003	4.70%	5.04%	5.09%	4.55%	3.24%	5.13%	3.88%	4.44%	3.99%	4.63%
2004	3.35%	4.07%	3.55%	3.27%	1.59%	4.02%	4.30%	2.90%	3.16%	3.45%
2005	2.46%	2.80%	2.22%	2.21%	1.17%	2.11%	2.28%	1.77%	2.20%	2.24%
2006	1.96%	2.62%	1.76%	1.11%	1.29%	1.94%	1.71%	1.69%	1.73%	1.90%
2007	1.19%	1.29%	1.18%	0.96%	1.35%	0.75%	1.78%	0.92%	0.91%	1.03%
2008	0.47%	0.66%	0.52%	0.86%	0.68%	0.52%		0.49%	0.42%	0.52%
2009	0.66%	1.57%	0.60%	0.53%		0.61%			0.48%	0.56%
2010	0.41%	0.90%	0.25%	0.29%	0.43%	0.32%	2.44%	0.31%	0.51%	0.42%
2011		0.81%				0.26%			0.51%	0.18%
2012										
Total	7.08%	8.28%	5.67%	1.49%	1.19%	7.52%	8.13%	5.69%	6.58%	6.78%

¹⁸ The Mobile test stations are vans that travel to car dealers to test used vehicles for sale. These vehicles are prepped for resale and therefore have a lower failure rate than public vehicles arriving at the other test stations.

Exhibit 28

The total number of compliance documents issued to inspection stations

Month/ Station	Clackamas 940	Gresham 941	Medford 949	Northeast 943	Scappoose 937	Sherwood 945	Sunset 939	Mobile One	Mobile Two	Tech Center 936	Total
January	10,000	-	-	8,000	-	6,000	8,000	-	-	-	32,000
February	6,000	-	-	4,000	2,000	6,000	10,000	-	-	-	28,000
March	10,000	-	-	6,000	-	6,000	8,000	-	-	-	30,000
April	10,000	14,000	-	8,000	-	8,000	12,000	-	-	-	52,000
May	10,000	12,000	4,000	12,000	-	8,000	12,000	2,000	-	-	60,000
June	10,000	-	8,000	8,000	2,000	8,000	12,000	-	-	-	48,000
July	13,000	14,000	8,000	15,000	1,000	14,000	18,000	2,000	2,000	-	87,000
August	11,000	12,000	2,000	5,000	-	2,000	12,000	-	-	-	44,000
September	-	3,000	3,000	-	-	6,000	-	-	-	-	12,000
October	18,000	4,000	9,000	5,000	2,000	3,000	14,000	-	-	-	55,000
November	18,000	12,000	9,000	16,000	1,000	19,000	33,000	2,000	2,000	-	112,000
December	-	6,000	-	-	-	4,000	6,000	-	-	-	16,000
Total	116,000	77,000	43,000	87,000	8,000	90,000	145,000	6,000	4,000	-	576,000

Exhibit 29

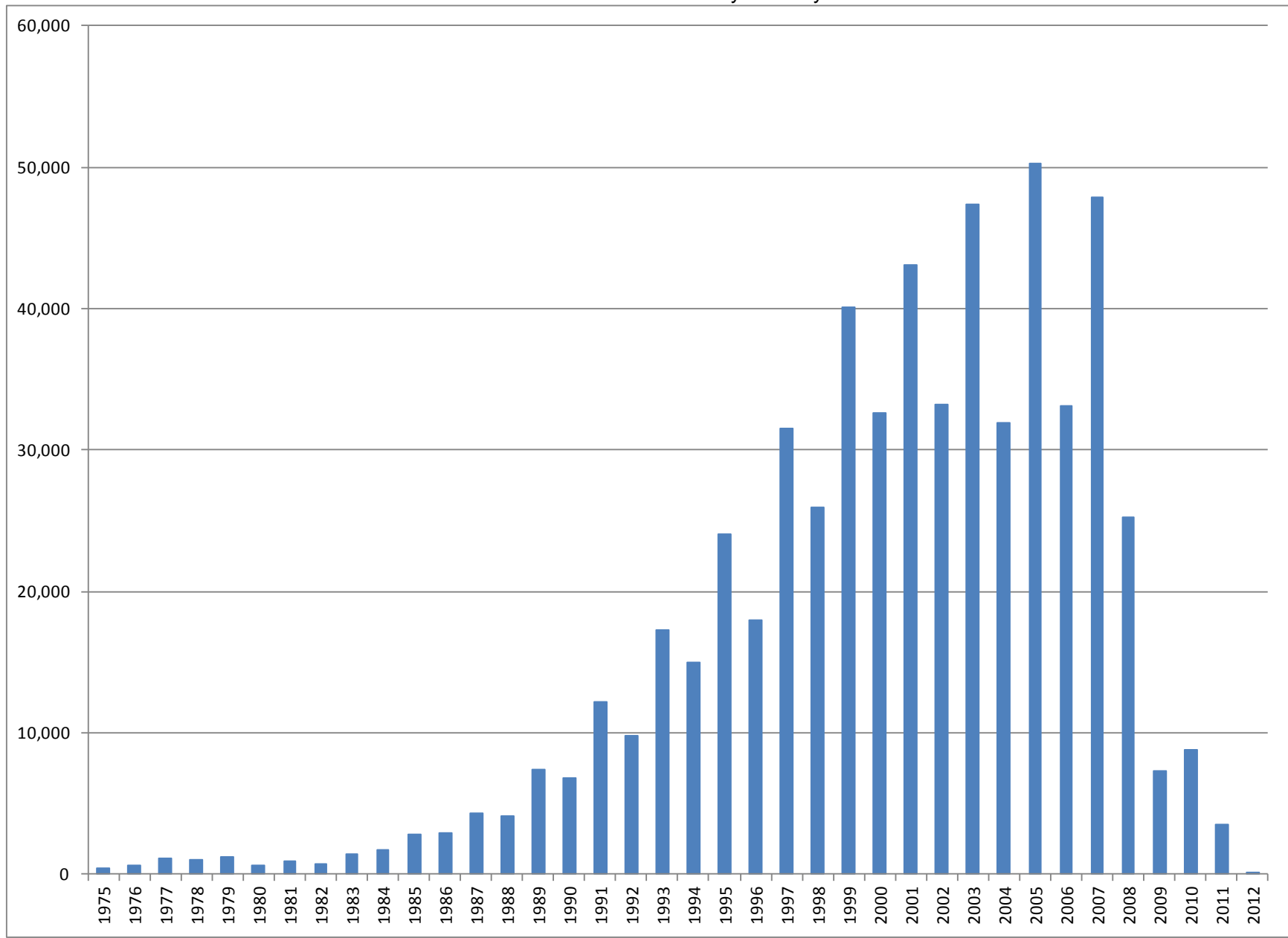
Vehicles receiving a waiver¹⁹

Month/ Waiver	9401 Issued	Permanent Medical	New Vehicle	Total
Previously		4		4
January	50		0	50
February	70		4	74
March	80		1	81
April	57		4	61
May	85		5	90
June	24		2	26
July	88		2	90
August	59		3	62
September	65		1	66
October	43		1	44
November	50		1	51
December	45		1	46
Total	716	4	25	745

¹⁹ For an explanation of the waivers Oregon offers, see [Test Data Report \(2\)\(V\)](#).

Chart 1

The number of vehicles tested by model year²⁰



²⁰ Due to Oregon's biennial test program, more odd-numbered model years are tested in odd-numbered test years and more even-numbered model years are tested in even-numbered test years. This is a direct result of the year of initial vehicle purchase and registration.

Chart 2
The number of vehicles failing initially by model year

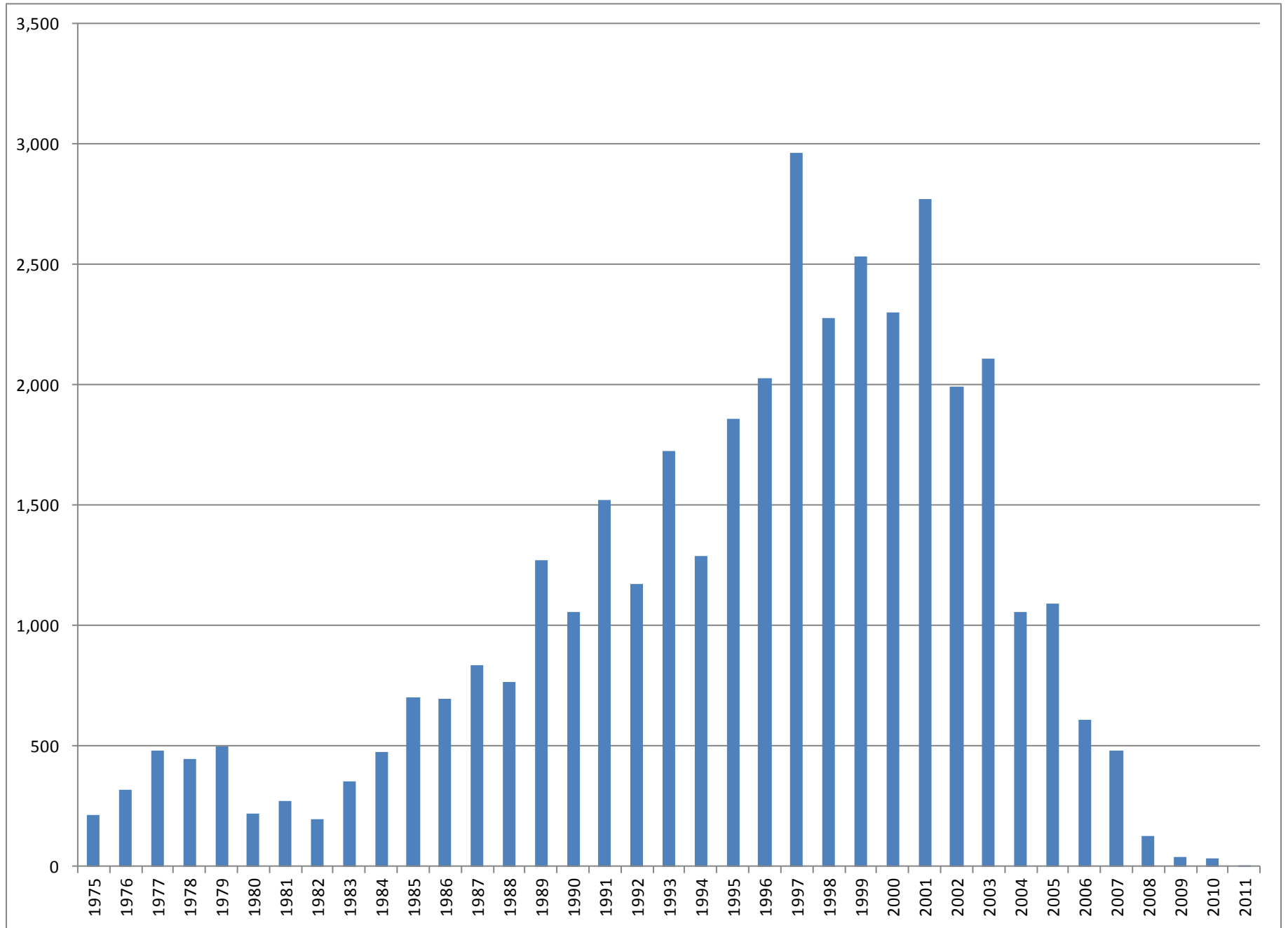


Chart 3
The percentage of vehicles failing initially by model year²

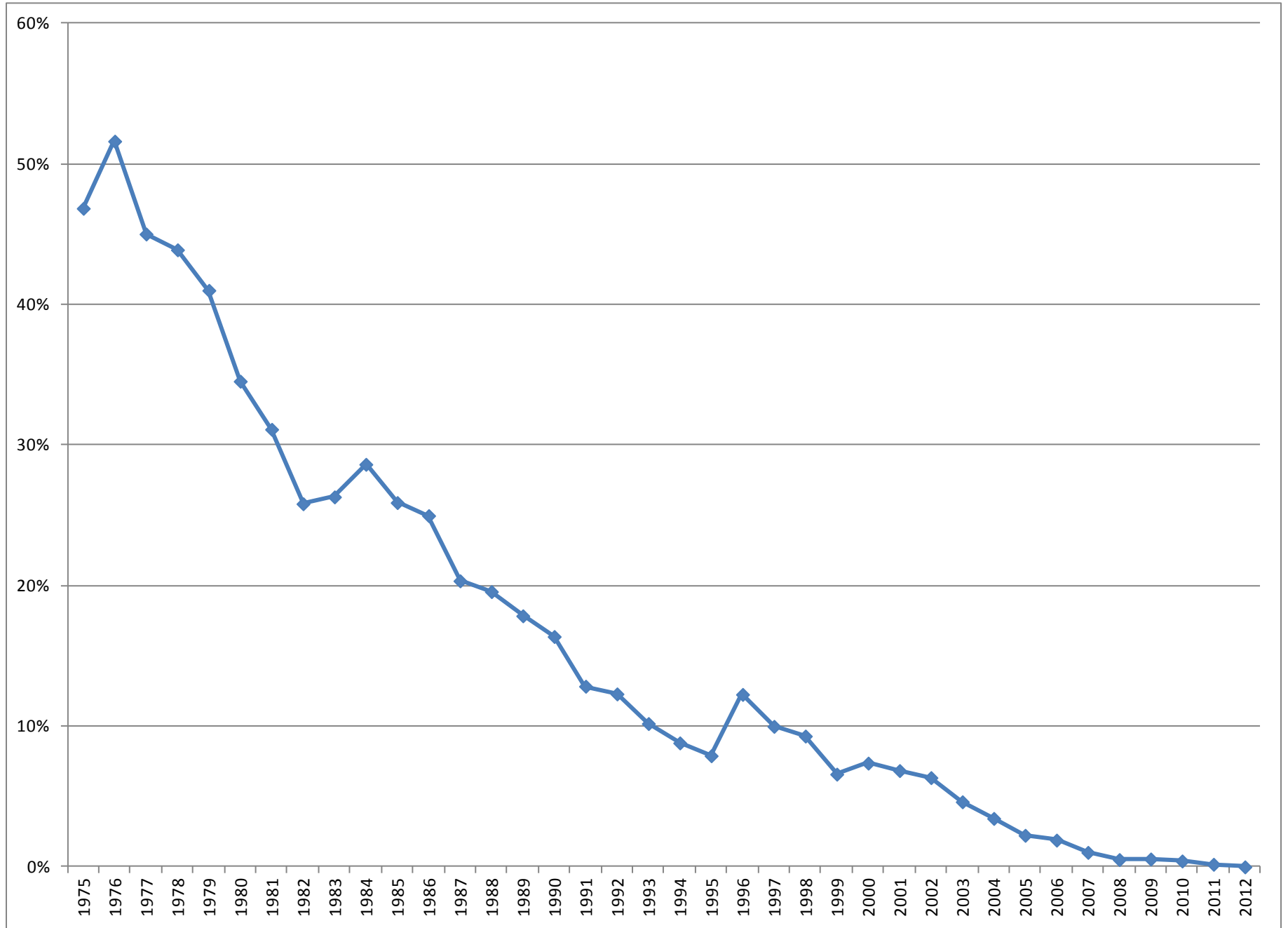


Chart 4
The number of vehicles failing the first retest by model year

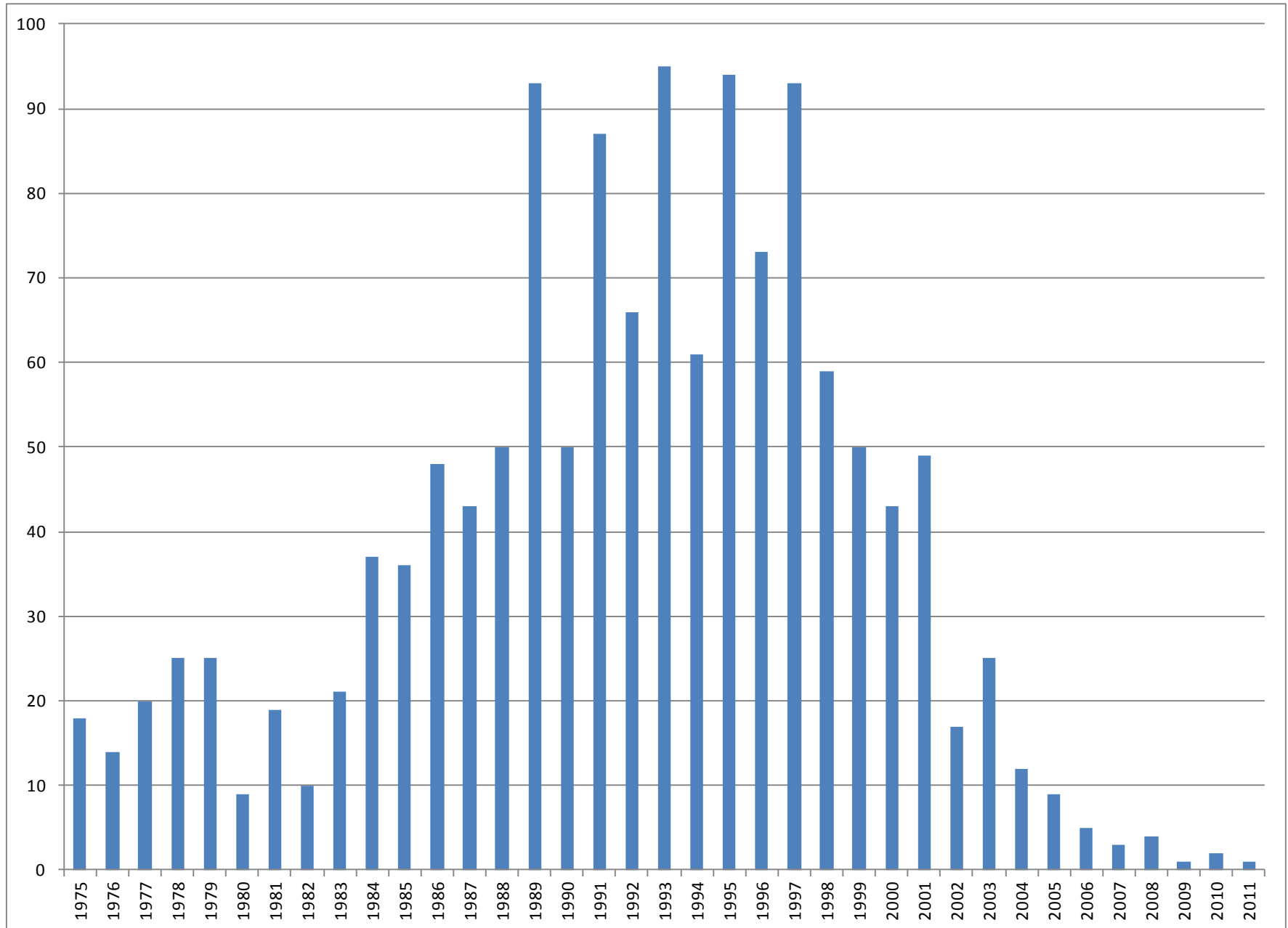


Chart 5

The percentage of vehicles failing the first retest by model year³

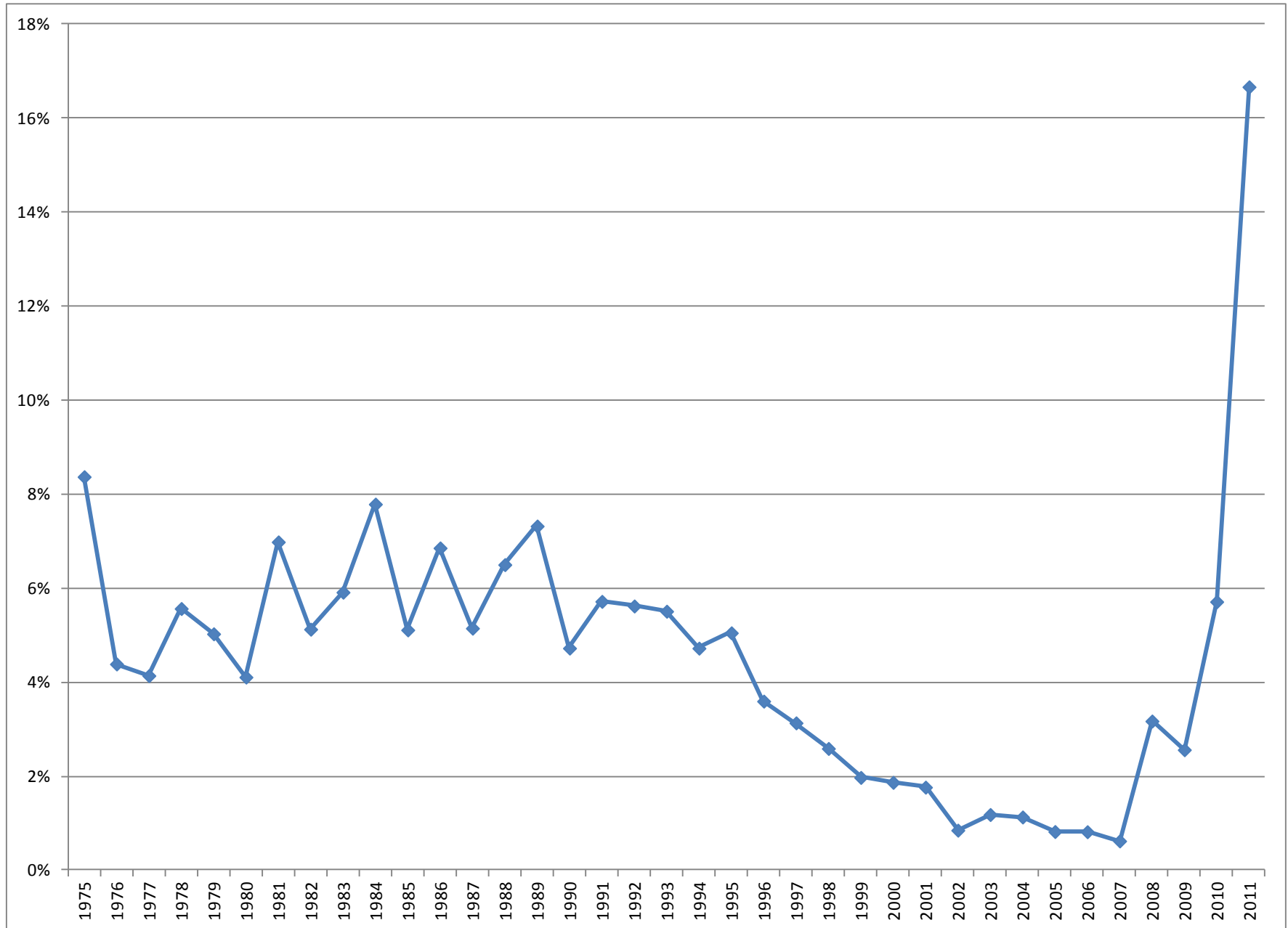


Chart 6
The number of vehicles passing the first retest by model year

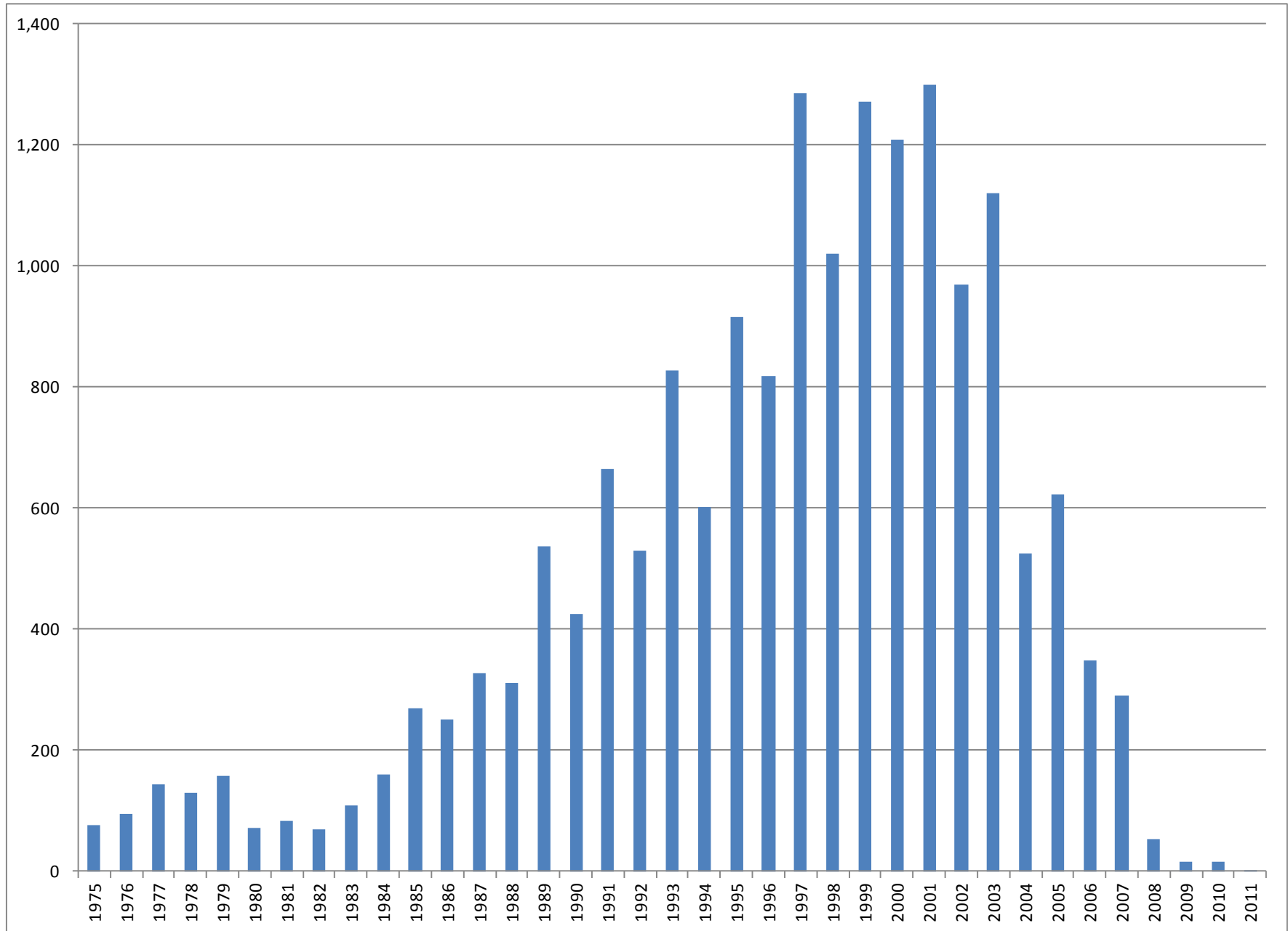


Chart 7
The percentage of vehicles passing the first retest by model year⁴

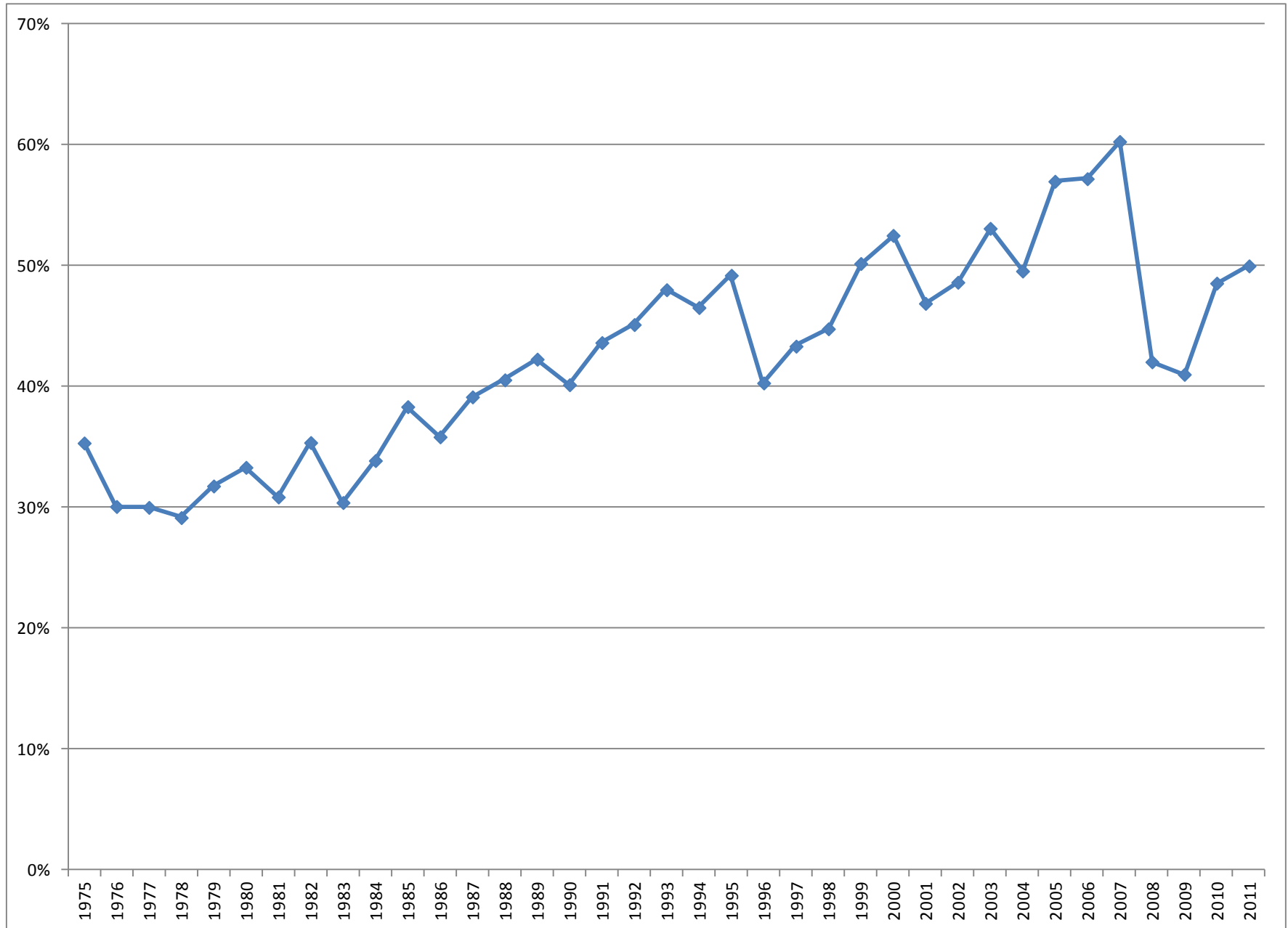


Chart 8

The number of initially failed vehicles passing the second or subsequent retest by model year⁵

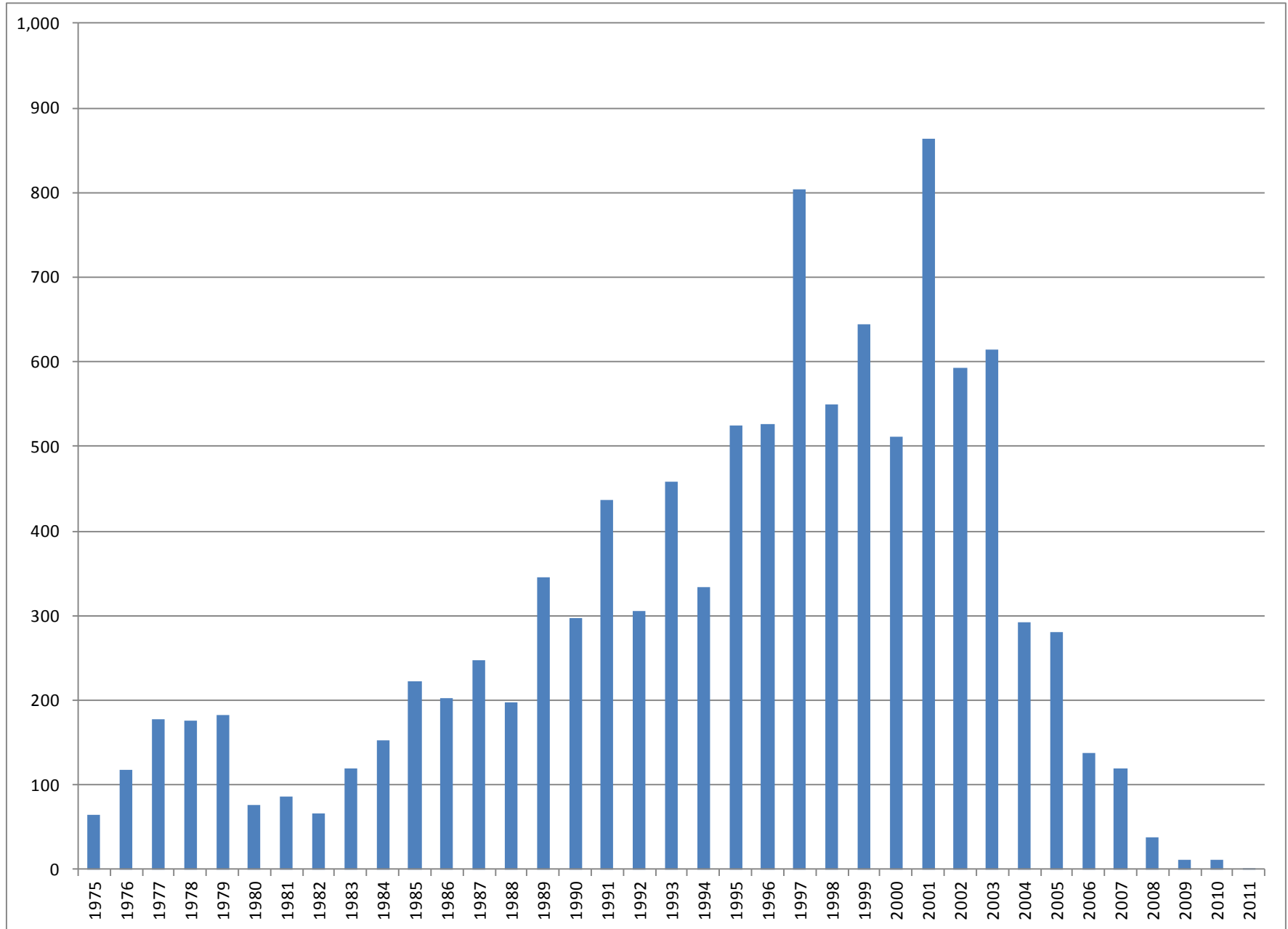


Chart 9

The percentage of initially failed vehicles passing the second or subsequent retest by model year^{5, 6}

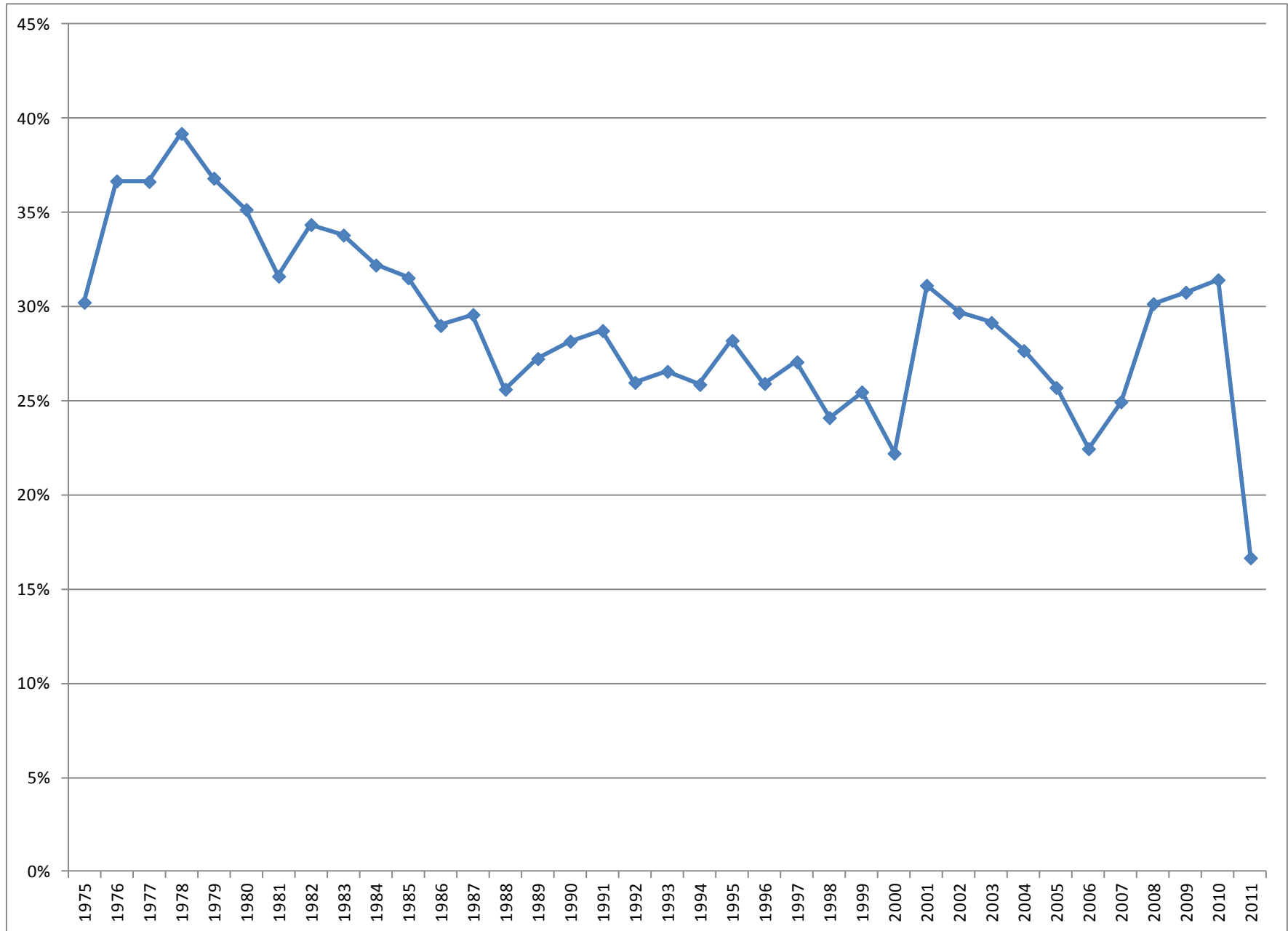


Chart 10

The number of initially failed vehicles with no known final outcome (regardless of reason) by model year⁷

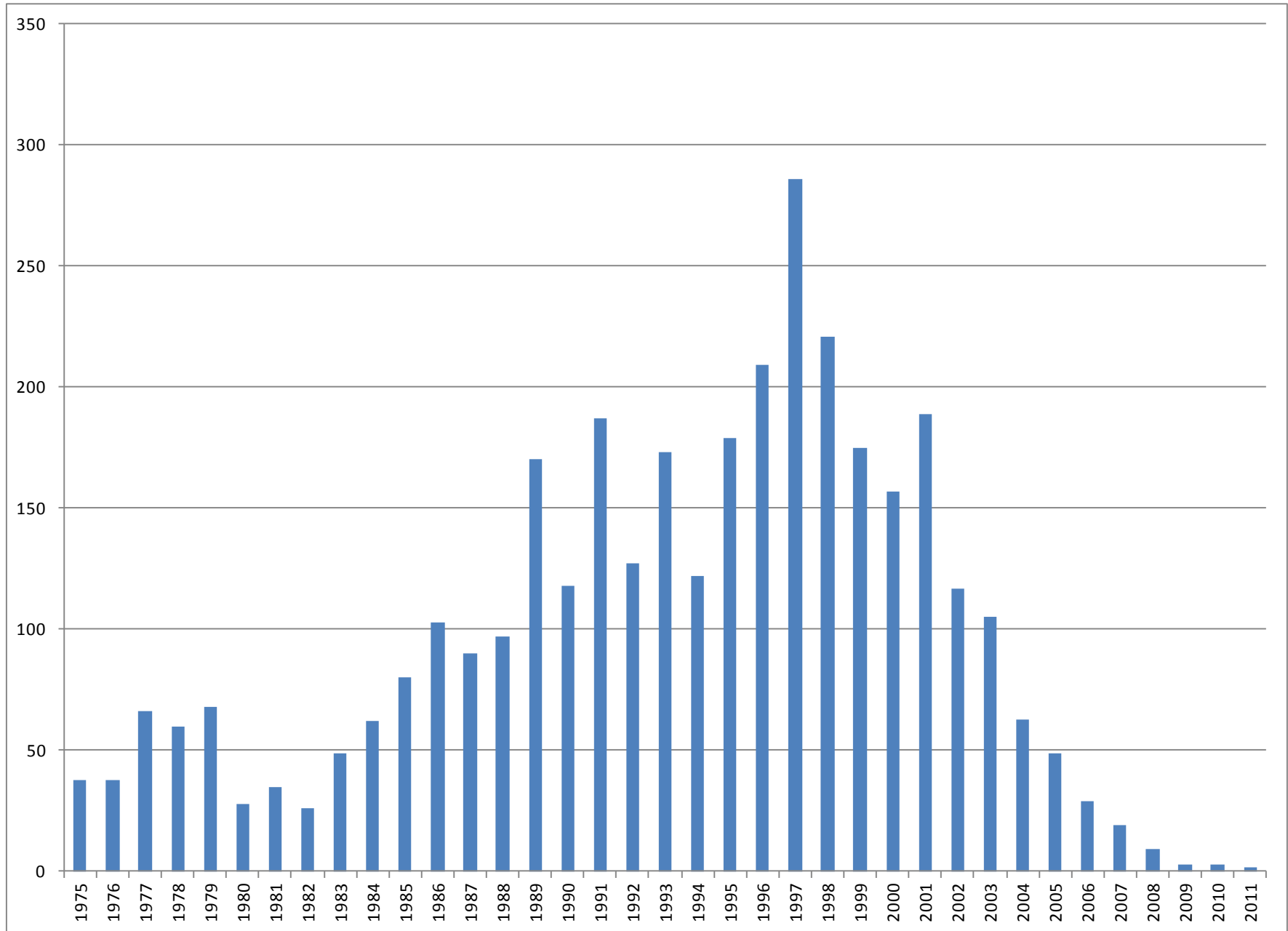


Chart 11

The percentage of initially failed vehicles with no known final outcome (regardless of reason) by model year^{7, 8}

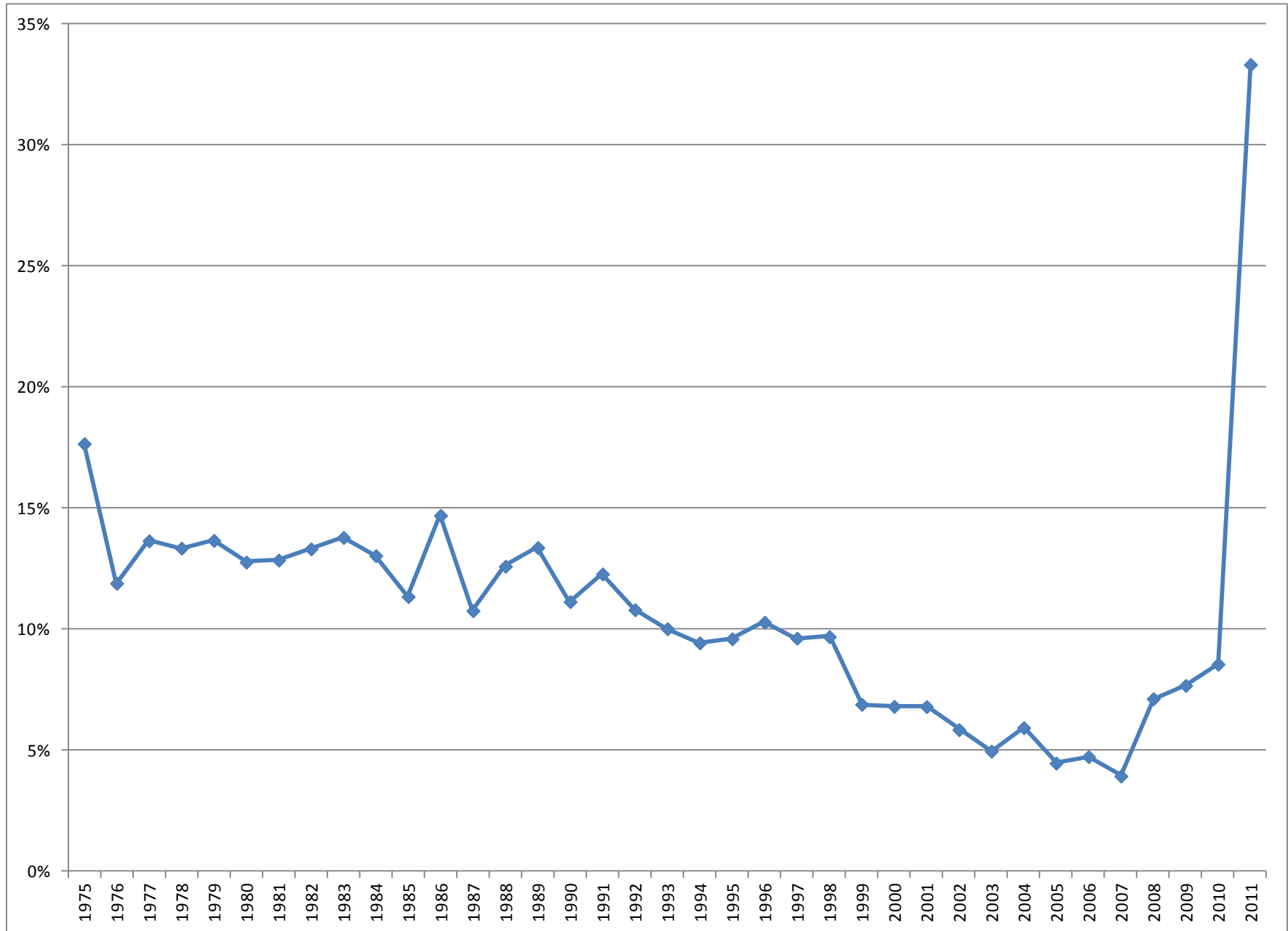


Chart 12

The number passing the on-board diagnostic check by model year

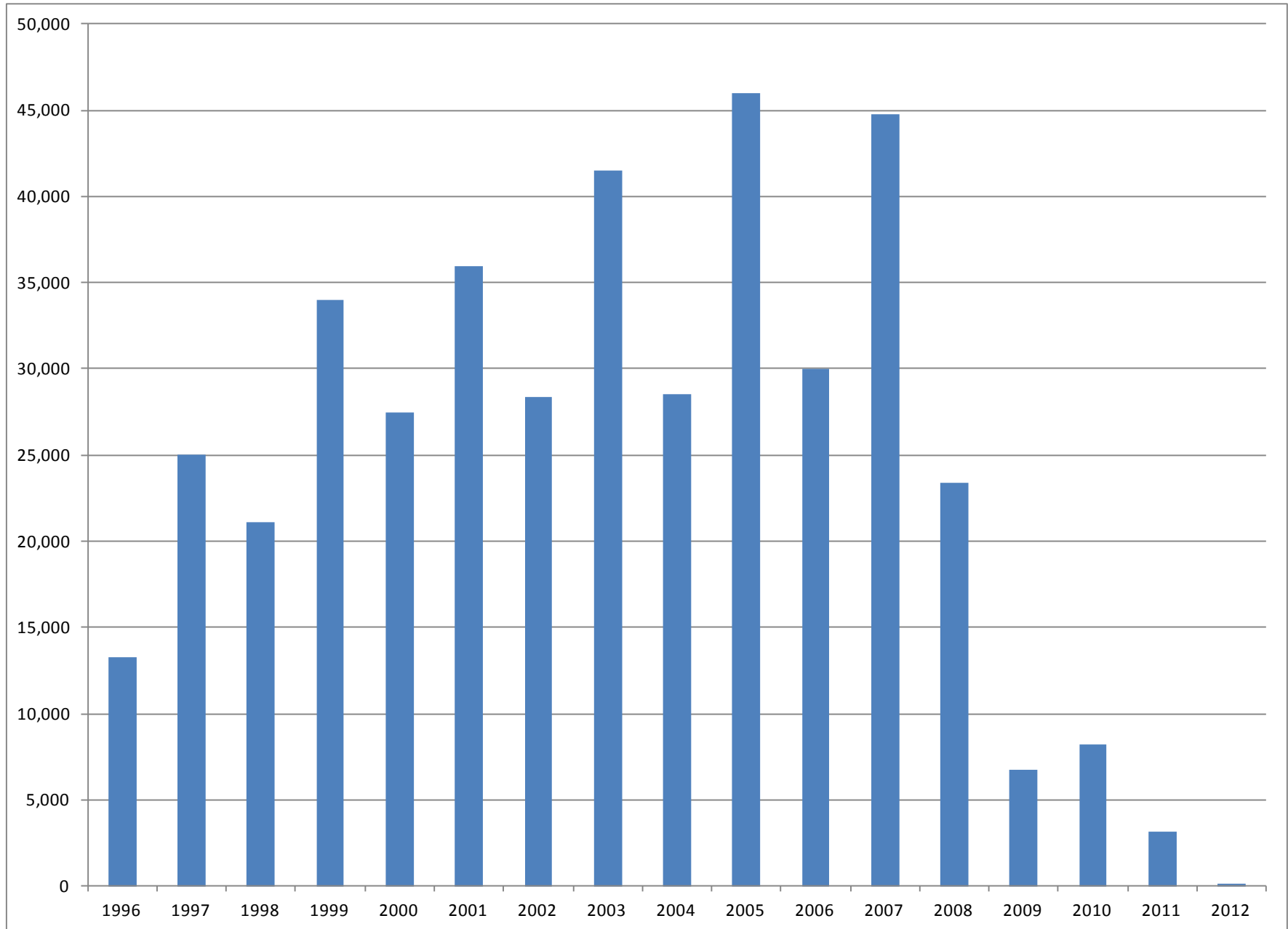


Chart 13

The percentage passing the on-board diagnostic check by model year¹⁰

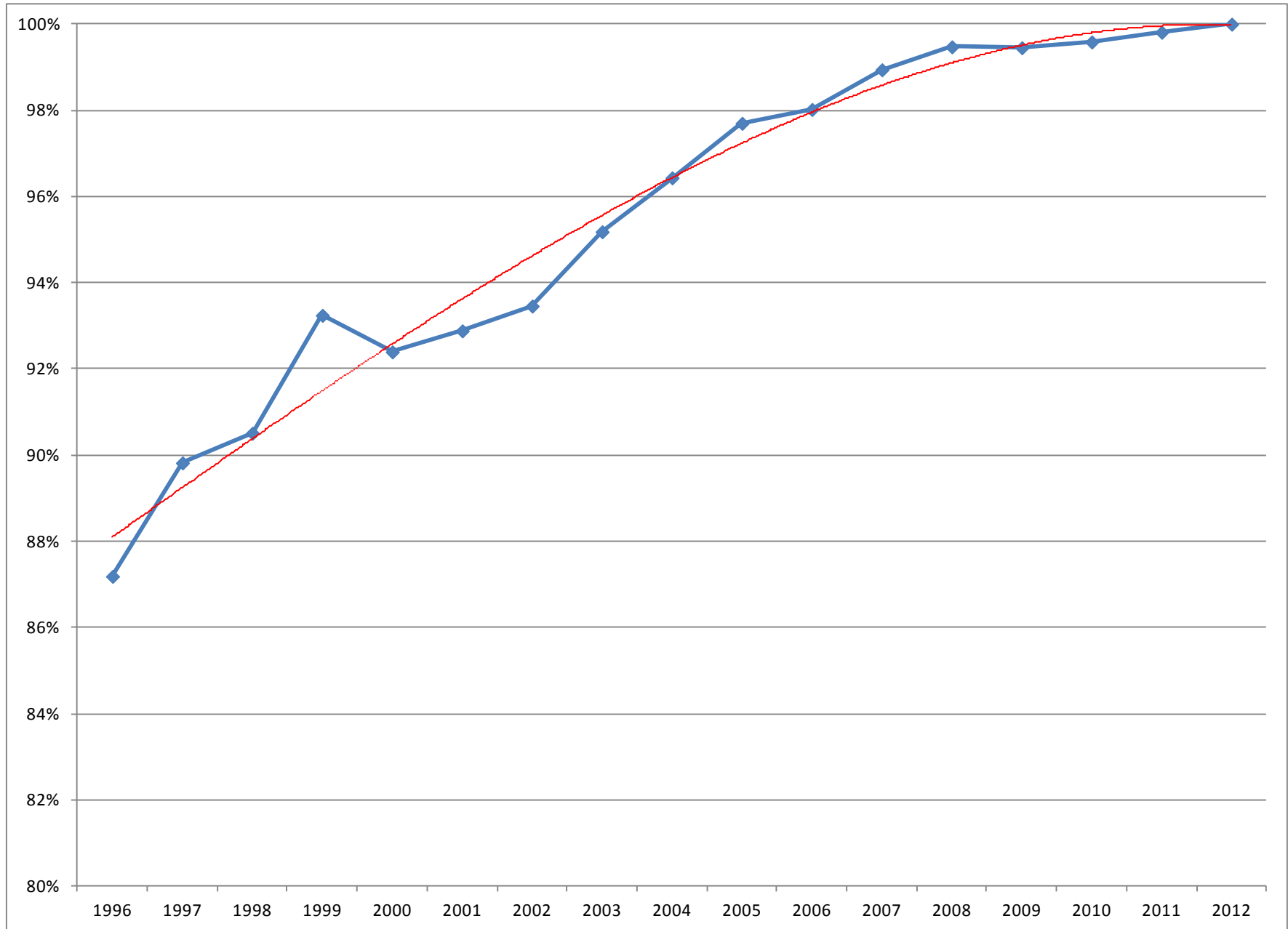


Chart 14

The number failing the on-board diagnostic check by model year

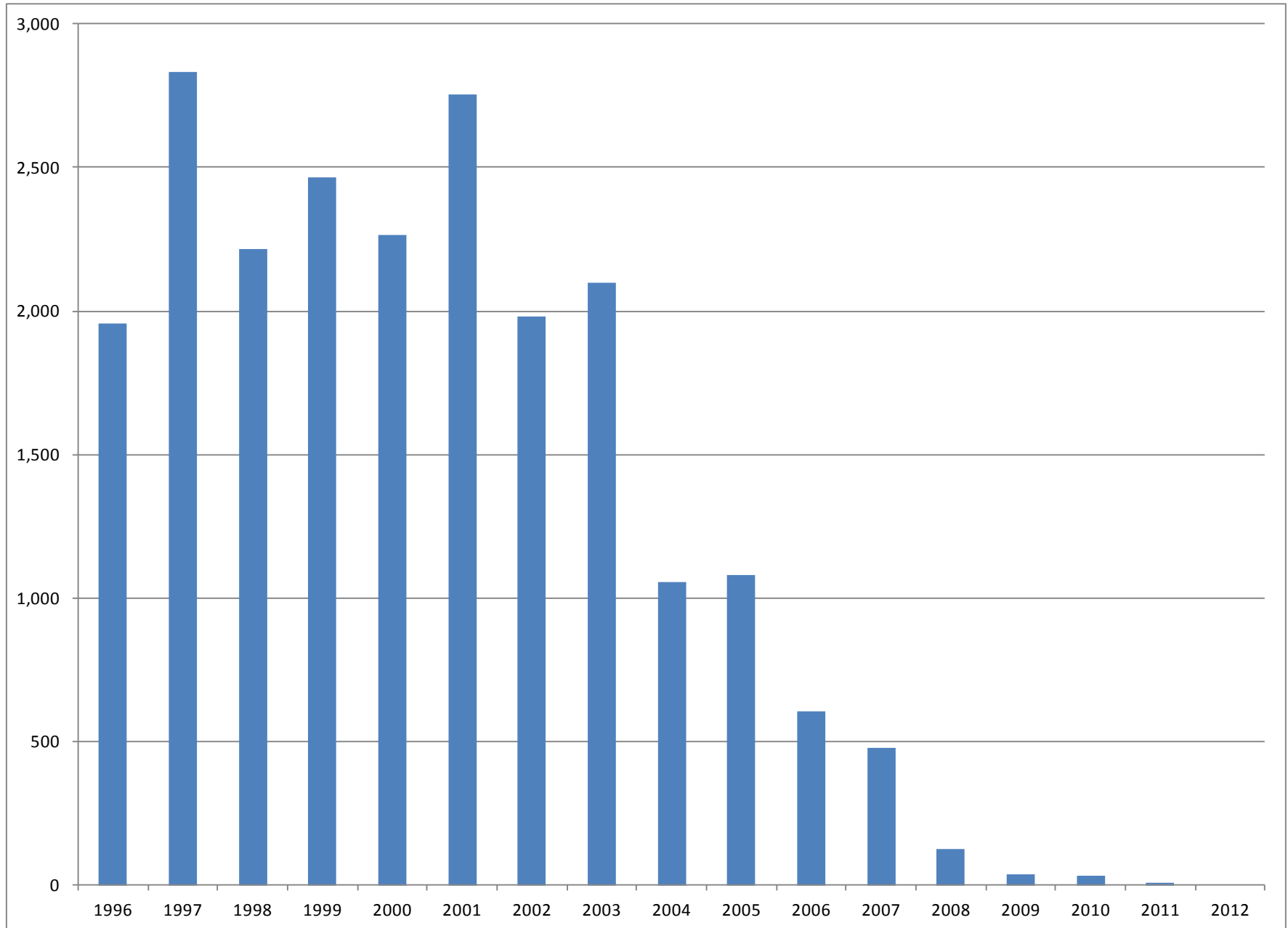


Chart 15

The percentage failing the on-board diagnostic check by model year¹¹

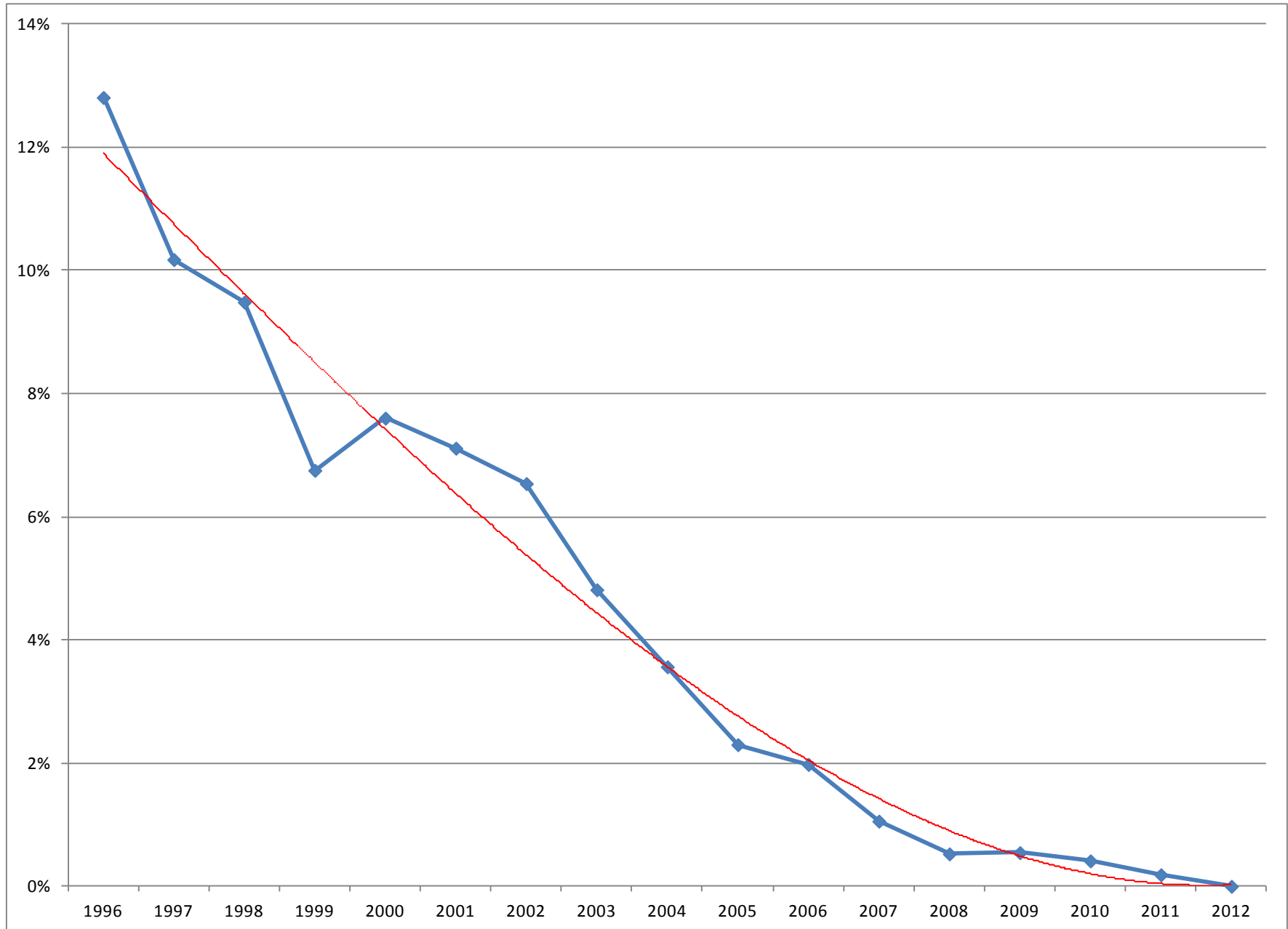


Chart 16

The number where readiness status indicates that the evaluation is not complete

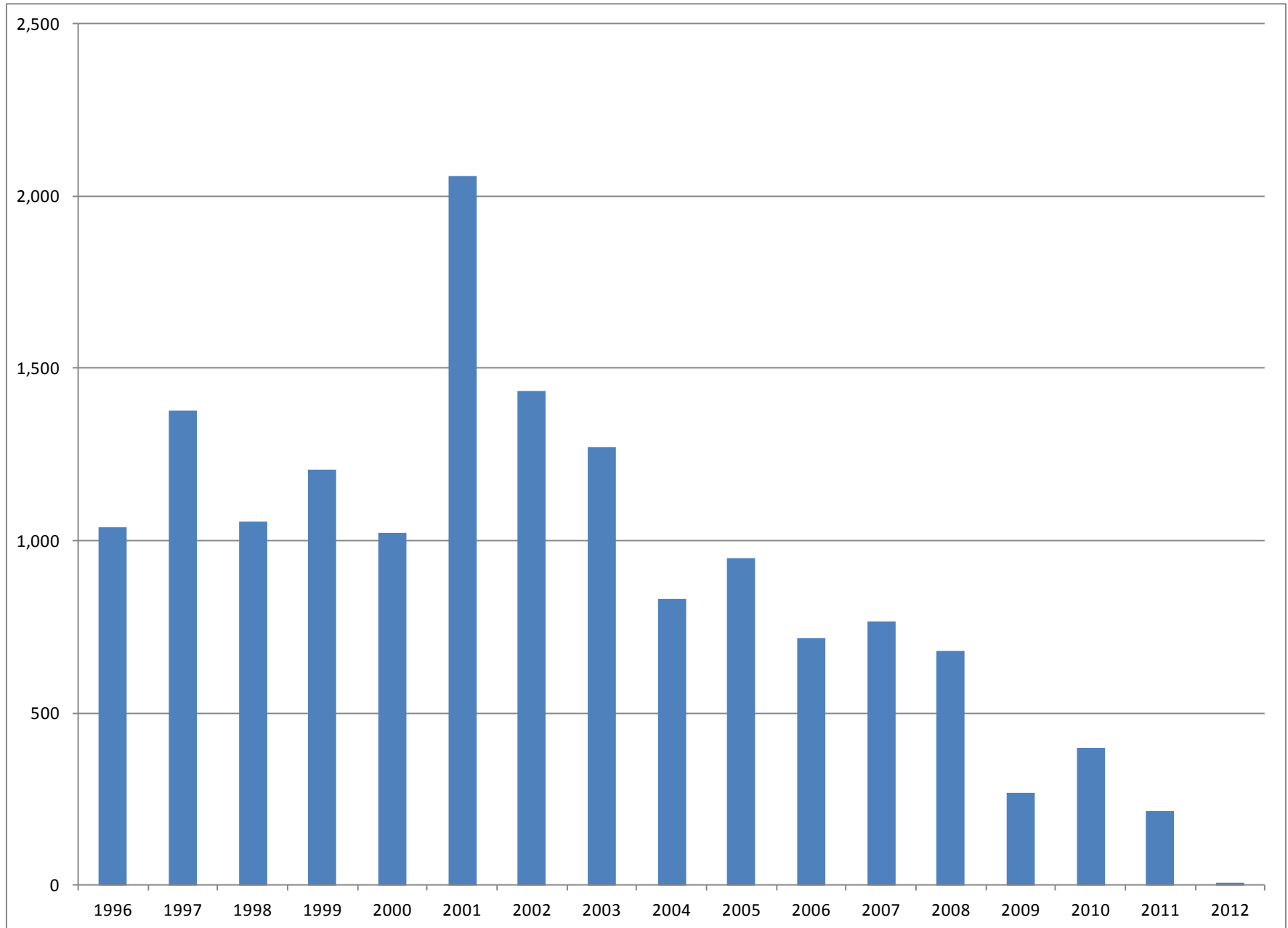


Chart 17

The percentage where readiness status indicates that the evaluation is not complete¹⁶

